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Contents

Editorial : Some information about the department. .... [1]

On the inheritance of twinning in Bengalee rural population.
A. B. Daschaudhuri and S. Basu .... [5]

Maternal age effects on adult stature in inbred and non-inbred males.
D. P. Mukherjee .... [11]

Some observation on schedule tribes.
M. Bhattacharya .... [15]

A study on congenital malformations among neonates of Calcutta.
A. R. Banerjee and A. K. Hati .... [25]

Anthropological studies in India : focal point on human evolution.
Asok K. Ghosh .... [33]

The concept of mesolithic stage and an example from eastern India.
Ranjana Ray, Ujjaini Basu and Asok K. Kundu .... [39]

Agriculture, technology and environment.
Biswanath Banerjee and Saktipada Haldar .... [45]

Rethinking an anthropological study in an Indian university.
Syamal Kanti Sengupta, Arnab Das and Subrata Sankar Bagchi .... [49]

The expanding horizon of anthropology with particular reference to India.
P. K. Bhowmick .... [61]

Faculty members of the department. .... [69]

EDITORIAL

Some Information about the Department

✍ *Anthropology was first included in the University of Calcutta in 1918, as a part of the curriculum of Ancient Indian History and Culture. Two years later in 1920, it was given the status of an independent subject for study in M.A., M.Sc. courses subsequently a separate Department of Anthropology was formed. A number of illustrious persons like R. P. Chanda, P. C. Mahalanabis, H. C. Dasgupta, B. A. Gupta, L. K. A. Iyer, H. C. Chakladar, S. C. Mitra, B. C. Mazumdar, P. Mitra, A. N. Chatterjee, T. C. Das, K. P. Chattopadhyay, B. C. Guha, T. C. Roy Chowdhury, R. M. Basu, N. K. Bose, D. Sen, S. S. Sarkar, P. C. Biswas, S. S. Bose, J. K. Bose, M. N. Basu, G. S. Ray were teachers of this department. With the untiring efforts of the above mentioned personalities and the members of the present faculty, a well organised Department equipped with facilities for teaching and conducting research emerged. The Department offers specialisation in three major branches, Physical Anthropology and Human Genetics, Social and Cultural Anthropology, Palaeoanthropology and Prehistoric Archaeology.*

PHYSICAL ANTHROPOLOGY

This department being the oldest one in the country and one of the oldest in the whole of Asia, the credit goes to the earlier faculty members specially to Dr. S. S. Sarkar for the development of the section of Physical Anthropology. Sarkar initiated and contributed towards fundamental anthropological studies to examine population variation through classical anthropometric techniques. In course of time, in the section of physical anthropology well equipped laboratories were set up and faculty members engaged themselves in conducting researches in various fields of serogenetics, serum proteins, human cytogenetics, hair studies, twin studies, forensic anthropology, dermatoglyphics, population genetics etc. A special feature of this department is the technical knowledge for studies in methodology of serogenetics, quantitative genetics, genetic epidemiology and twin genetics. A number of research projects have been undertaken with the financial assistance from C.S.I.R., I.C.M.R., U.G.C., Bureau of Police Research and Training and Department of environment.

In the physical anthropology, palaeoanthropology laboratory and museum, there is a sizeable collection of human skulls from contai, Midnapore and other areas. Rare specimens of non-human primates skeleton, stuffed specimens of tarsiers, lemurs, monkeys, gibbons, chimpanzees, orang-utan etc. are exhibited. specimens of human foetuses of different ages, plastic and plaster casts of fossil men, fossil ape like Dryopithecus and Ramapithecus skulls make up the collection. There are models of typical human faces from different parts of the world representing different races.

SOCIAL ANTHROPOLOGY

In social and cultural anthropology, the department seeks to equip the students with a knowledge of material culture and its evolution; social organization; religion and magic, effect of social, economic and other forces on cultures, social stratification, cultural ecology, economic anthropology, action anthropology; rural and tribal way of living and cultural transformation; and Indian civilisation.

The department also offers practical training in field methods in tribal areas. Dissertation work is done on various social and cultural problems. In this way the students are equipped with the expertise in formulating and designing research proposals. Results of intensive research is brought out in the form of a few monographs. They are : 'Lodhas of West Bengal', 'The Social Profiles of Mahalis', 'The Chenchus', 'The Mundas', 'The Portrait of Mahali Economy', 'The Social System of a Bengal Village', 'The Applied Anthropology : meaning and necessity' and 'The Occult Art'.

At present the department is actively engaged in various projects on action anthropology, social stratification, economic anthropology, cultural ecology, rural development, social framework of slum life, some aspects of Indian civilisation and of cultural and social background of preservation and destruction of environment. Research on the problems of parents of the Mentally Retarded children and their rehabilitation is a recent endeavour.

The significance of the ethnographic museum in the department is no less important in terms of its uniqueness and comprehensive nature, especially from historical perspective. Its collection includes a rich variety of textiles, garments, shawl, magnificent headgears, spears, shields, weapons and other tools. The tribes of North East region are well represented, they are the Garo and Khasi of Meghalaya, the Dafla, Abor and Mikir of Arunachal Pradesh, the Nagas of Nagaland. The specimens include precious gifts from noted ethnographers like Hutton and Mills. Collection from other tribes are there viz., the Korku of Melghat forest, M. P., the Asur and Oraon of Chotonagpur, the Bunas of Bengal and Andamanese and Nicobarese of the Andaman group of islands. The total collection opened up large vista of the fascinating cultural variation observed among the Indian tribes. Some of these specimens are unique. Worth mentioning are the quadrilateral plough of Indonesia, cross bow of Angami Naga, Garo dancing sword and glass bead necklace of Abor women. Models of housetypes of different parts of India are also displayed in the museum. Practical work on ethnography depends largely on these specimens as well as field data.

PALAEOANTHROPOLOGY AND PREHISTORY

Study of Prehistoric archaeology as a part of Anthropology began in the thirties of this century. Dharani Sen, one of the members of the classic Yale-Cambridge expedition and Prof. N. K. Bose had contributed much to the development of this branch of Anthropology. Both of them had equipped the prehistory laboratory with valuable instruments for field survey, exploration, excavation, preservation and analysis. Over the years the present faculty had added to both field and laboratory facilities *of this section. Active research is carried out by the teachers, students and scholars on acquisition of cultural evidences and proper understanding of the early culture. Special emphasis is given on the human evolution both biological and cultural. Traditional prehistory as well as current methods are taken into consideration. Relevant research is carried out on the ethnoarchaeology. This is to learn about the importance of the practices of early men still important for the present day population as well as to reconstruct the past ways of life. The former included ethnomedicine. Petrological study has grown in importance for the proper understanding of tools and artefacts and process of selectivity. Every year field work is conducted for discovery of new sites and assessment of old ones. In this way the department has gathered a wealth of prehistoric artefactual remains.*

The prehistory museum made a spectacular beginning with some materials collected through Yale-Cambridge expedition. These constitute large number of stone tools and animal fossils. Accession of materials continued with accleration. The Departmental teachers carried out an excavation in Mayurbhanja area of Orissa. Through exchange of prehistoric materials from Africa and Europe, the collection was also enriched since, 1930's the Departmental teachers and research workers have made significant contribution of prehistoric materials from almost all parts of India. A representative collection on Harappan pottery and other objects were presented to the Museum by the Archaeological survey of India. The prehistoric museum of the Department of Anthropology, Calcutta University is provided with a number of identities with regards to the antiquity, collection, arrangement and classification of the materials. Scholars like V. G. Childe, P. Grazisoi, D. Pnyes, J. Golson, P. V. Tobias, V. D. Krishnaswamy, A. Ghosh, K, K, Thapar and many more have visited the museum and worked on the materials. All of them were impressed with this museum.

LIBRARY

The department is proud of a well stocked library. At present the library contains more than sixteen thousand books and about ten thousand journals, including back volumes, periodicals, bulletins, manuals and census reports. Besides, the library has a very rich collection on Naga group of people. At present the library is receiving about thirty journals per year. The department is thankful to Sri Binoy Bhusan Roy for his useful service to this library in its formative period. This department is rich in some rare and old collections of books and journals, some of them are mentioned below :—

JOURNALS :

1. *Journal of Royal Anthropological Institute. Vol. 1 (1872).*
2. *American Anthropologist. Vol. 1 (1899).*
3. *Biometrica. Vol. 1 (1901-02).*
4. *American Journal of Physical Anthropology. Vol. 1 (1918).*
5. *Man in India. Vol. 1 (1921).*
6. *Proceedings of prehistoric society. Vol. 1 (1935).*
7. *Journal of American Museum of Natural History. Vol. (1964).*
8. *Africa Vol. 1 (1928).*
9. *Man Vol. 1 (1901).*

10. *Journal of the Anthropological Institute Vol. 1 (1872).*
11. *Journal of the Royal Anthropological Institute Vol. L (50) 1920.*

ENCYCLOPAEDIA :

1. *Encyclopaedia of Mundarika.*
2. *Encyclopaedia of Social Sciences – 1931.*
3. *International Encyclopaedia of Social Sciences – 1968.*
4. *Encyclopaedia of Britanica.*

OTHERS :

1. *Census reports from the year 1891 onwards and District Gazetteers of different States.*
2. *Linguistic survey report of G. A. Grierson.*
3. *Monographs of different tribes.*
4. *Zeitschrift fur Morphologie and Anthropologie by R. Fischer.*
5. *Cold Spring : Harbour symposia on quantitative Biology – Vol. 13 (1948).*
6. *Twelve volumes of Oxford English Dictionary.*
7. *Four volumes of Sumner's Social Sciences.*
8. *Three volumes of Mother by R. Brifault.*

Students strength of this department has increased over the years from mere eight to twenty five in each session. Students of this department get upto date academic information. There is an active participation of students in all matters of the department. Department regularly organises workshop, seminar, symposia and lectures. The students are much involved in these.

There are a number of scholars engaged in research on all three branches of Anthropology. They are working in various capacities like research scientists, associates and scholars.

There are well qualified staff members who devote their working hours in the development and smooth running of this department. The office, laboratory, museum and library personnels, work untiringly. Success of this department is largely due to the unified effort of the students, scholars, staff and teachers who are highly coordinated with each other.

Anthropology department did not have a journal of its own until the present one is published. There was a publication by the Calcutta University in the name of Journal of the Department of Letters. It was first published in 1920 and continued upto 1935. Fundamental research findings from several departments were included in it. Works of renowned Anthropologists like Ramkamal Mukherjee, T. C. Das and J. K. Bose were part of these journals.

Several attempts were made to bring out a journal from this department. The endeavour materialised only through the kind support of Prof. R. N. Basu, Vice Chancellor and Prof. P. N. Roy, Pro-Vice Chancellor (B. & F.), University of Calcutta. Mention should be made of the active interest of the Press Superintendent Sri Pradeep Ghosh, and his colleagues. All the teachers, scholars, staff and students have contributed in various capacities in bringing out this journal.

RANJANA RAY

On the Inheritance of Twinning in Bengalee Rural Population

A. B. Das Chaudhuri and S. Basu

Abstract : An attempt has been made in the present study using twin materials from the Bengalee population to throw some light on the question of hereditary nature of twinning 77 pedigrees each with at least 4 generations were collected from the rural Bengalee population inhabiting villages surrounding Habra township in North 24-Parganas, West Bengal. Out of 77 pedigrees, the families consisted of 185 pairs of twins The Bengalee population shows a twinning frequency generally corresponding to 0.0125. The probability of random occurrence of one, or more twin deliveries in a family area, equivalent to that of pairs in our sample (i e. in one, or more of the six examined sibships) turns out to be, P = 0.3339. The theoretical and experimental distributions of twinning in the family area of 185 index pairs were found to be 61 and 169 respectively. The observed frequency of cases with twinning in the family area corresponds to nearly thrice what should have expected from a random distribution. So, it may be inferred that pairs are not distributed at random in the family area, but follow a causal factor which groups families of twin pairs a number of twin cases greater than expected This indicates that the phenomenon of twinning is due to a cause inherent to the family biology i.e. to a genetic factor. Thus, it can be concluded that twinning is familial trait fits the hypothesis of genetic control.

Introduction

Credit goes to Goelert (1870) who first suggested on the basis of data on 132 twin pairs that the phenomenon of twinning might be hereditary. After rediscovery of Mendelian laws attempts have been made by many investigators to establish whether twinning is hereditary and if so its mode of inheritance. In this context, there exists considerable amount of literature which have aptly been summerised by Gates (1957) and Gedda (1961). Results of existing literature indicate that the problem of hereditary nature of twinning is still inconclusive. However, twinning rates among relatives of twins are at most slightly higher than the rate in the general population.

Since the beginning of the present century many investigators considered separate types of mode of inheritance in respect to monozygotic (MZ) and dizygotic (DZ) twins as their origins are different. Of course, most of the workers Roberts (1905), Weinberg (1909), Davenport (1919), Wehefritz (1925), Fetscher (1928), Detweiler (1933), Curtius and Verschuer (1932) and Greulich (1938) advocated that the given hereditary factor was of the recessive type. Nylander (1970) with his study among the Jorubas in western Nigeria concluded that DZ twins is very difficult to reconcile with the theory of genetic determination of twinning by a single gene. The finding that both MZ and DZ twinning may occur in the same family led Gedda (1965) to conclude for singleness of the tendency to twinning to be ascribed to a single Gemellogenetic factor or 'G' factor. From the above it appears that neither the inheritance of twinning nor its mode of inheritance is well established.

Given above, it has been attempted in the present communication to throw some light on the question of hereditary nature of twinning with Bengalee twin materials as no Indian worker has explored this fundamental problem of twin study since to date.

Materials and Methods

For the present study 77 pedigrees each with four generations were collected from the rural Bengalee population inhabiting villages surrounding Habra township in North 24-Parganas, West

Bengal. Information on incidence of occurrence of twins was first detected in a particular family and then considering twins as proband the pedigree was constructed upto four generations. Age of mother of twins, sex of twins, mortalities of twins etc. were noted. Some important pedigrees are shown in Appendix–I. Our material altogether consists of 185 twin pairs. In taking down data, we did not consider the number of twin pairs among the paternal or maternal branches but only their presence or absence. Thus, the material on which we did base the present research consist of 185 twin pairs distributed as shown in Table 1.

Table 1. *Distribution of twinning in the parental branches*

		Paternal branch		
		Yes	No	Total
Maternal branch	Yes	16	53	69
	No	100	16	116
	Total	116	69	185

In the first step, only the existence of other cases in family area (regardless of whether paternal or maternal) was taken into consideration. The problem was to establish whether the number of twin pairs with twinning in the family are found in the sample corresponds to the number of pairs we would have found of the distribution of twinning in a similar sample had taken place at random and according to the population frequencies. The theoretical distribution was calculated on the basis of the fact that the present survey concerning twinning included the sibships of the parents and the grandparents (average six sibships in all of each twin index case) and the size of the average Bengalee sibship has been considered to be around 4 persons.

RESULTS AND DISCUSSION

Considering that the Bengalee population shows a twinning frequency generally corresponding to 0.0125, it is possible to calculate the probabilities of random occurrence of one or more twin deliveries in four sibling sibship. Such a probability is 0.0491. Thus, the probability of random occurrence for one, or more twin deliveries in a family area, equivalent to that of the pairs in our sample (i.e. one, or more of the six examined sibships), turns out to be the following.

Twinning in 1 sibship	P = 0.2946
Twinning in 2 sibship	P = 0.0361
Twinning in 3 sibship	P = 0.0023
Twinning in 4 sibship	P = 0.0008
Twinning in 5 or 6 sibship	P = 0.0001
Total probability	P = 0.3339

The computation of total probability (i.e. 0.3339) when referred to the 169 pairs examined leads to the theoretical distribution shown in Table 2 which indicates that the pairs with twinning in the ascendancies should be 61. Therefore, 33.39% of the index pairs should have shown at least one twin delivery in the six sibships of the family area.

Table 2. *Theoretical and experimental distribution of twinning in the family area of the 185 index pairs*

	Pairs with twinning in the family area	Pairs without twinning in the family area
Theoretical	61	124
Experimental	169	16

In fact, the experimental data prove the presence of nearly thrice this number of pairs showing other cases of twinning in the family area. This actually takes place in 169 pairs, equal to 91.35% of the sample. From the Figure 1, it is apparent that the observed frequency of cases with twinning in the family area corresponds to about thrice what we should have expected from a random distribution.

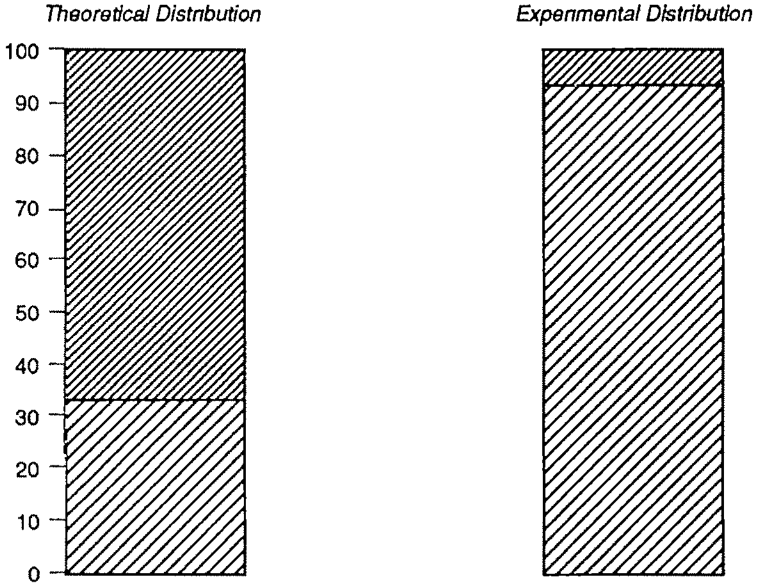

Figure 1

▨ *Index cases with twinning in the family area*

▨ *Index cases without twinning in the family area*

So it is clear that the pairs are not distributed at random in the family area, but follow a causal factor which groups in the families of twin pairs a number of twin cases greater than expected This greater frequency leads to exclude that twinning depends only from external factors operating at random, thus indicating that the phenomenon is due to a cause inherent to the family biology i.e. to a genetic factor. Thus, we conclude that twinning is a familial trait which fits the hypothesis of genetic control.

ACKNOWLEDGEMENTS

This research work was supported by Major Research Project Grant No. F.3-316/90 (SR-II) from the University Grants Commission, New Delhi. We acknowledge our gratitude to the twin pairs and family members who have participated to this study.

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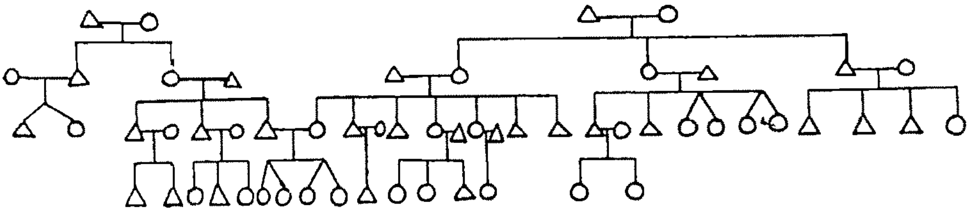
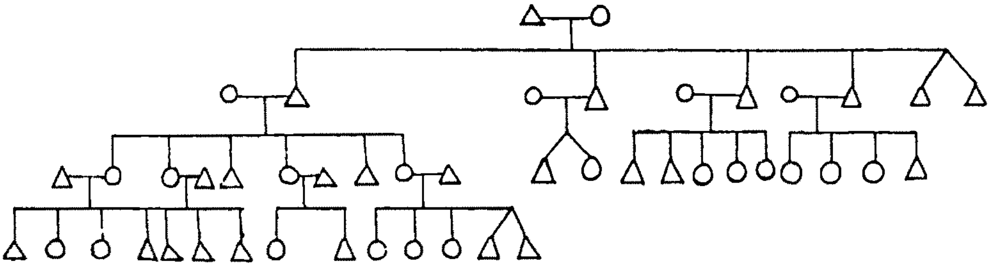
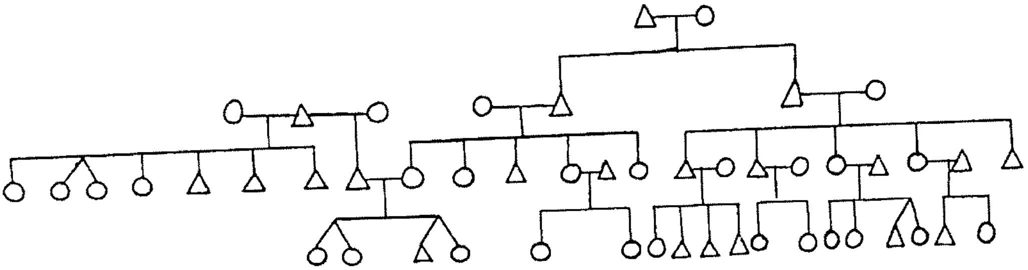
APPENDIX : I



Pedigree 5. Incidence of two pairs of twins in family.



Pedigree 7. Twinning in families in successive generation.

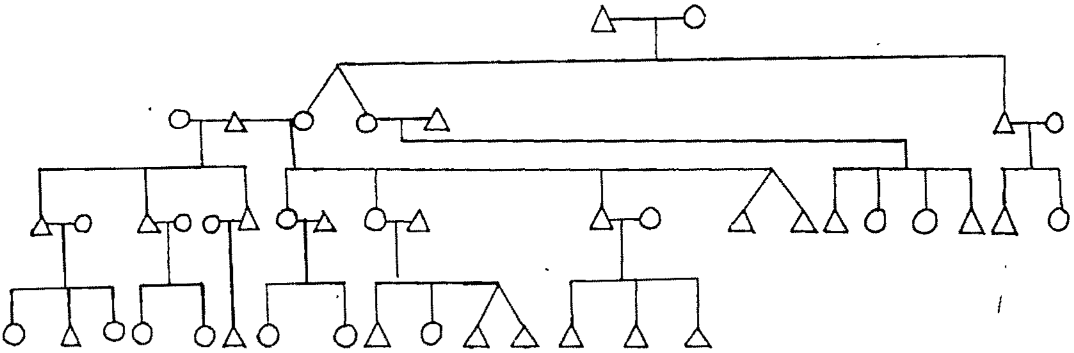


Pedigree 1.

(i) With one wife one pair of twins both females.

(ii) With another wife son has two pairs of twins one same sexed females and the other unlike sex.

(iii) Two pairs of twins in a family.



Pedigree 16.

(i) Mother herself being a member of same sexed female twins produces a pair of same sexed male twins.

Maternal Age Effects on Adult Stature in Inbred and Non-Inbred Males

D. P. MUKHERJEE

ABSTRACT : Adult males who were born to mothers of early teen age are found to have a relatively taller stature on average than those born to moderately older mothers in three different endogamous populations and in their inbred and on-inbred subsamples. A smaller variability of stature in the former group of men in most of the subsamples and an increased maternal age effect on inbred males in two populations strengthen the hypothesis of selection against small body size in the offspring of very young girls, who are known to have a high risk of foetal loss and perinatal infant mortality More adequate data would be necessary to verify the weak suggestion of a similar effect of high maternal age obtained from these results

INTRODUCTION

It has been observed in course of a series of investigations into the influences of mating patterns and differential survival of offspring on quantitative human variations that body dimensions of adult males may to some extent be related with the age of their mothers when they were born. Some critical evidence of maternal age effects on stature of both inbred and non-inbred males from three allopatric endogamous populations are presented here with a brief discussion on the possible interpretation of the findings.

MATERIAL AND METHOD

The analysis is based on data on stature of male individuals aged between 20 to 50 years whose parents were closely related as first cousins, double first cousins, and for Telugu speaking populations also maternal uncle and niece, and of their male relatives of the same age-group whose parents were nonconsanguineous. These data were collected along with extensive pedigrees during 1977 to 1987 from (1) the Gampasati Kamma population of Chittoor district, Andhra Pradesh, (2) the Telugu speaking Telaga population of Kharagpur, West Bengal, and (3) the Sheik Sunni Muslims of the Memari police station area of the Burdwan district, West Bengal mainly by two scholars-Muttapalle Lakshmandu (1982) and Arindam Mukherjee (1989, 1990 a & b) who have studied inbreeding and genetics of various multifactorial traits in these populations (Mukherjee 1984; Mukherjee et al. 1990). For the present study, the maternal age at the time of birth of each subject has been derived from the pedigree data, and the errors of estimation is further minimised by grouping of maternal ages of successive five years or more according to the nature of the data.

The significance of mean differences in stature of individuals with the lowest maternal age-group from those with higher maternal ages has been examined by applying the t-test. However, as the t-test is not applicable in the strict sense due to apparent differences in variability; and as significance is a function of the sample size, consistency of results in the six subsamples has been considered as a more dependable indicator of realibility of results.

RESULTS AND DISCUSSION

The most remarkable and consistent result of the present analysis is that the stature of adult males who were born during the early teen age (Below 15 years) of their mothers are on average taller than adult males who have higher maternal ages, and especially those whose mothers were 15 to 29 years old when they were born (Table 1; Fig. 1). The excess of average stature in males with the lowest maternal age over that of males with moderately high maternal age from about 15 to about 34 years appear to be significant at 5 percent level of probability both among the inbred and non-inbred males of the Bengalee Muslims of Burdwan district. However, it is not found to be significant at that level in the inbred subsample of the Telaga population, obviously due to the small number of available males with the lowest maternal age, and also in both inbred and non-inbred subsamples of the Gampasati Kamma population. The average stature of males born in the later years of reproductive life of their mothers also tends to be greater than males with moderately lower maternal age from about 15 to about 30 or 34 years, with a single exception of the non-inbred group of Muslim males of West Bengal due to obvious error of a very small sample of males born to mothers in their late thirties to forties.

The observed maternal age effects on adult stature cannot be easily attributed to the influence of in utero environment as in the case of birth weight or birth length of infants. A possible explanation of this phenomenon can therefore be sought in the natural selection against genetically small sized foetuses and infants of adolescing mothers, who are known to have high risks of foetal loss and perinatal infant mortality. Such a hypothesis is indeed strengthened by the suggestion of a greater magnitude of the maternal age effect on stature in the inbred males than in non-inbred males among two of the three populations, (the sampling fluctuation in the non-inbred Muslim subsample does not lead to its rejection) and by the lowest coefficient of variation of stature in the males born to mothers, who are younger than about 15 years, in five out of the six subsamples studied from three different populations (Table 2). There are also instances of relatively low variability of adult stature in males with the highest range of maternal age, but the suggestion of a similar process leading to the increase of mean stature in this group of males in the present data is yet rather too weak.

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Table 1. *Mean (m) stature in mms. of inbred (IN) and non-inbred (NI) adult males with different maternal age-groups among the Gampasati Kamma (GK), the Telaga (TG) and the Sheik Muslim (SM) populations. The t-values for difference of means from that of males with the lowest maternal age-group are also shown*

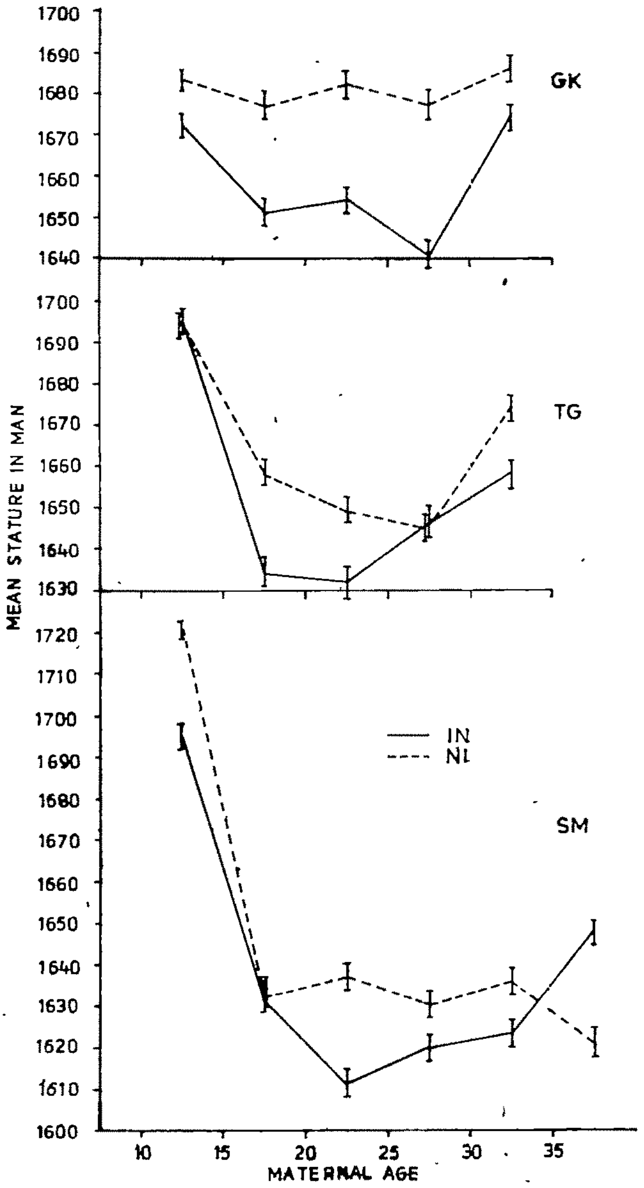
Population	Maternal age-group in years	IN				NI			
		n	m	se	t	n	m	se	t
GK	Below 15	37	1672.3	9.0		27	1683.4	11.4	
Chitoor Dt.	15-19	154	1651.1	5.4	2.0	95	1676.7	5.4	0.5
Andhra	20-24	65	1654.1	8.9	1.4	60	1682.0	6.6	0.1
Pradesh	25-29	20	1640.6	13.7	1.9	17	1677.2	12.4	0.4
	30 & more	10	1674.6	21.5	–0.9	10	1686.5	12.01	–0.2
TG	Below 15	5	1695.0	42.3		4	1694.5	15.7	
Kharagpur,	15-19	148	1634.9	5.0	1.4	173	1657.9	4.1	2.3
West Bengal	20-24	114	1632.7	5.5	1.5	162	1649.0	4.9	2.8
	25-29	42	1646.5	8.3	1.1	44	1645.2	8.9	2.7
	30 & more	5	1658.6	34.8	0.7	8	1674.7	21.3	0.8
SM	Below 15	7	1695.1	17.4		10	1721.5	21.0	
Budwan Dt.	15-19	20	1631.0	12.4	3.0	14	1632.1	15.3	3.4
West Bengal	20-24	20	1611.7	14.6	3.7	29	1637.7	10.3	3.6
	25-29	19	1620.7	17.8	4.2	29	1630.3	12.0	3.8
	30-34	8	1623.8	21.1	3.4	10	1636.7	17.0	3.1
	35 & more	9	1648.6	21.1	1.7	5	1621.4	28.2	2.8

Table 2. *Coefficient of variation (CV) of stature in inbred (IN) and non-inbred (NI) males with different maternal ages in three populations.*

Maternal age-group in years	Gampasati Kamma (GK)		Telaga (TG)		Bengalee Muslim (Sheik) (SM)	
	IN	NI	IN	NI	IN	NI
Below 15	2.9	1.9	3.3	3.5	2.7	1.2
15-19	3.7	3.2	4.1	3.1	3.4	3.3
20-24	3.6	3.8	4.3	3.0	4.0	3.4
25-29	3.3	3.6	3.8	3.0	4.8	4.0
30 & more*	3.3	3.4	4.1	2.3	3.7	3.3
35 & more					3.8	3.9

* (30-34) for Bengalee Muslims.

Fig : 1. Mean Stature in mm. and C.V. (vertical lines) of Adult Males of Different Maternal Ages.



Some Observations on Scheduled Tribes

M. BHATTACHARYA

ABSTRACT : Tribal people are considered as original inhabitants of India. There is disparity in identification of tribes in the schedule. Diversity is observed among the tribals in distribution pattern, literacy and economic standard. Tribals in India live in rural areas, are non-heirarchical and non specialised in tradition This paper has identified tribal areas in ecological background. Comparison of socio-economic condition between the tribals of central and north-east India is made.

Perhaps India is the second largest country in the world next to African countries, where diverse strains of millions of original inhabitants are living continuously from prehistoric past. Paleoanthropological discovery of Homo erctus skull, from Pleistocene bed in Narmada Valley is an illustration for the antiquity of Prehistoric man in India. Prehistoric culture of this sub-continent is about one million years old. Divergence of culture can be traced even in lower Paleolithic stage. Two separate traditions i.e., Chopper-chopping and biface or hand axe complexes were in existence in two separate ecozones along the foothills of the Himalayas in North West India and the peninsular part repectively (Sen 1964). Evidence of Early Man can be traced from almost all the corners of Indian sub-continent (Sankalia 1974). In fact India was never a place of *tera-incognita* so far prehistoric evidence of the Early Man is concerned (Subbarao : 1958).

Cultural diversity in India was present during middle, upper and late Pleistocene period. Different groups of specialised hunter gatherers spread in almost all corners of the country during post Pleistocene period. Post Pleistocene hunting gathering stage was succeeded by food production economy, the Neolithic stage. A lot of regional diversity is present in the pattern of Neolithic culture. Similar heterogeneity is well marked even in Harappan population (Kennedy 1969, '80, '84). It may be mentioned that a number of cultures contributed towards the flourishing of the Harappan civilization in the riverine basin of North West India, popularly known as Indus Valley civilisation. Hence, ethnic diversity is a unique phenomenon of Indian population right from the prehistoric times. Similar variation is found with the tribals of India.

Officially (Census of India, 1961) 354 communities are recognised as scheduled tribes, spread unevenly over the entire country. In 1984, tribals were reclassified into 609 Scheduled Communities of which 72 communities have been identified as Primitive Tribal Groups. There are controversies on the actual number of the tribal communities. Bose (1971 : 4) suggested that the number for tribal communities was 427. Roy Burman stated that there were 450 tribal communities in the list of scheduled tribes. Danda estimated a total of 642 tribal communities, several of them either become extinct or been merged with other communities (Danda : 1992 : 16). He further mentioned that two hundred twenty six of the entries represent synonymous sub tribes, or divisions of some major tribes. Danda considers 412 to be the total number (Danda 1992, 161-61). More over 20 percent is covered by nine major tribes. They are Bhil, Gond, Ho, Khond, Meena, Munda, Oraon, Santal and Naga. Most predominent tribes are Bhil, Gond and Santal. Madhya Pradesh alone accounts for 28 percent of the total population of Indian tribes.

Such controversy with regard to the total number of tribal communities might be owing to different reasons. In fact that there have been certain interferences in "scheduling" the communities as tribes. Tribal communities of Uttar Pradesh remained unrecognised till 1967. The Koles and other tribal groups of Varanasi Division were declared as Scheduled Castes. Even some subtribes have been given the status of tribes. Moreover, scheduling policy is not based on scientific definition of tribe. No strict taxonomic principle has been adopted for identification of the tribal groups. Serious errors in enumeration are found both in the census and in the preparation of the lists. Following are a few examples cited by (Reddy :1985).

There are 3 Konda Kapus in 1961 who multiplied to 225 in 1971. Similarly 86 Konda Reddi multiplied to 855 in 1971. 112 Kuruman in 1961 became 11,269 in 1971. During the same period Pallian grew from 1,551 to 3,108. The Todas are only confined to Nilgiris of Tamilnadu. A different community of Donkenikota of Dharmpuri district have similar name e.g. Thoda/Thoti or Toda. They have been enumerated as Toda tribe (Sinha : 1985). Such an instance of phonetic similarity might be the cause of inclusion of other communities as tribes. In the same way different names for the same tribe that are distributed over a wider area, might be responsible for inclusion such community as different and distinct tribes in the schedule. Some tribes have been identified by more than one names viz, Abor/Adi for Arunachal Pradesh, Kuni/Mizos for Mizoram, Mikir/Karbi of Assam etc.

Tribal people of India are in transition due to diverse forces of history. Here one can find the most primitive Negrito tribe having total population of a few hundred living in some inaccessible small islands of Andaman and at the same time there are a few well educated ones having higher literacy rate like the Mizo who are running their state and has got a place in cabinet Government. It is very difficult to identify common features which may be applicable to all the tribes or sub-tribes of 609 odd communities. The term 'tribe' in Indian context is not defined properly, neither by the anthropologists nor in the constitution. However, there are certain constellation of characters which can be used for unerstanding the Scheduled Tribes. For administrative purpose such characteristics may be used for categorising weaker section of Indian communities.

Tribals are largely found in rural areas. In historical context it seems that they were keeping their distance from the urban centres of this country. In contrast to caste ridden hierarchically arranged Hindu or Muslim societies the tribal cultures have some non-hierarchical traditional norms. Social cultural and economic life of tribals are better understood in their appropriate ecological setting. Non specialization is a fundamental feature of a tribal society. They live in different contact zones having low level technology with economy in subsistence level. Tribal people do enthusiam for entrepreneur activities or professional knowledge of trade and commerce is lacking along tribals. They live in segmentary social system tracing their common ancestry and binding themselves together by kinship system which generates a strong ethnocentrism. Such ethnocentrism becomes much enforced when community members interact with each other sharing common dialect which is another distinctive feature of the tribe concerned. In fact, Bhowmick (1990 : 36-37) rightly observes that traditional songs, incantation and common rites, ritual and tribal festivals convey some ideas, manifest identification and uphold tribal/group collectivity. These are interlaced inextricably with their cultrue. Tribal communities are in principle egaliterian, homogeneous and they lack social stratification. There is a causal effect relationship of the above with nonspecialised economic involvements of the tribal concerned.

Indian tribal communities have different cultural background and demographic characters. They differ in numerical strength. Raza and Ahmad (1990 : 7) adopted a statistically rationalised scale for classifying tribal communities on the basis of their numerical strength. Numerical ordering of the scheduled tribes, a total of 354 communities, is based on Log-Normal Distribution for size. They are major, medium, minor and insignificant (Table 1).

Table 1. *Numerical Ordering of the Scheduled Tribes based on Log-N~~o~~rmal Distribution. (Adopted from Raza and Ahmad, 1990)*

Category	Range of Population in each category			Number of tribal groups in the category	Total population in each category	Col (4) total tribal population
Major	114,082	to	154,107	38	24,262,785	84,77
Medium	5,659	to	96,174	102	3,977,171	13,31
Minor	253	to	484	133	232,179	01,12
Insignificant	1	to	248	61	4,582	00,02

The tribal area is broadly divided into three zones : north eastern, central and southern. Each zone has different ecological, economic, demographic, linguistic and cultural characteristics well as geo-ethnic identities.

A study on spatial distribution of tribal population reveals that highest density of 923 persons per square kilometer is found in Lakshadweep. Tribal population densities of Valsad and Surat districts and Dadra and Nagar Haveli are high, 101-150 persons per square kilometer. Following districts have moderately high densities, 51-100 persons per square kilometer. They are : Bharuch, Vadodra, Rastra; Jhabua and Dhar of Madhya Pradesh; Banswara and Durgapur in Rajasthan; Sundargarh, Keonjhar and Mayurbhanj in Orissa, Singhbhum, Ranchi, Dhanbad, Santal Parganas in Bihar; Jalpaiguri in West Bengal. Besides these West Tripura also belongs to the high density category (Raza and Ahmad 1990 : 27).

High density of tribal population is found to be surrounded by a contiguous zone of moderate to low density (21-50 persons per sq. km.). Tribal districts which belong to this category are Bastar, Manipur North, Khasi, Jayantia and Garo Hills. The Korapur district, Mikir Hills have 11-20 persons per sq. km. Kinnar, Lohul and Spiti, Cacher Hill and Arunachal Pradesh as well as Andaman and Nicober Island have below 16 persons per sq. km.

With the help of cartographic approach Raza and Ahmad arrive at the conclusion that the spatial distribution and concentration of the population resulted in distinct region formation. On the basis of Weaver's combination method, they have mapped cores and peripheries of major tribal communities like Meena, Bhil, Gond, Santal, Naga. Such tribal cores are mutually exclusive with certain degree of overlap in the peripheries of some tribes. Such region formation of core and periphery is based upon three variables, tribal concentration rate in district level, index of concentration and location quotients of tribal population.

With the help of location quotients Ahmad grouped the tribal population districts into six categories (Table 2). They found that fortyeight districts situated in hilly rugged terrain and forested tracts contain 5 to 15 times of the tribal population of country. These areas are mostly negative to usual settled agriculture. Such areas are also located in compact clusters over the central Vindyan complex, extending upto the eastern fringe of Chotanagpur plateau. Those areas having location values less than 5 is generally fragmented. Nontribal people penetrated resulting into dilution of the tribal concentration.

Index of concentration values at State level reveals that Bihar, Madhya Pradesh and Orissa has more than 10 percent each of the tribal population of the country. Nagaland, Mizoram, Meghalaya and some other Union territories, where the tribal population constitutes a high proportion of the total population, have a meagre share together contains only 5 percent of all the tribal population. On the basis of composite index methcd Raza and Ahmad sorted out cores and peripheries of the five major tribes : Bhils, Gonds, Santals, Mundas and Nagas. The spatial distribution of the cores and peripheries of these tribes points out following characteristics (Raza and Ahmad 1990, 36 : 37). i) Both the core and periphery of the tribal group are compact, as for example Bhil territory. ii) The periphery is compact but the core is fragmented as for example Gond and Santal territories. iii) The core and periphery is fragmented as for example Meena territory. iv) The tribal group has a compact core but there is no periphery as for example Naga territory.

Table 2. *Districts categories according to location quotients.*

Categories	Districts (State)	Total	Cumulative frequencies
Dominantly Tribal Above 13	Dangs (Gujarat) Manipur West, Manipur East (Manipur) Mokokchung, Tuensang (Nagaland) Subansin (Arunachal Pradesh) Laccadive, Minicoy and Amindivi Islands, Mizoram	9	9
Nigh Tribal Concentration 11-13	Lahaul & Spiti (Himachal Pradesh) Jhabua (Madhya Pradesh) Manipur North (Manipur) Garo Hills, United Khasi & Jaintia Hills (Meghalaya) Kohima (Nagaland) Kemeng, Siang (Arunachal Pradesh) Dadra & Nagar Haveli (Total number of districts 9)	9	18
Important 8-11	North Cachar Hills (Assam) Ranchi (Bihar) Kinnaur (Himachal Pradesh) Mandia, Surguja, Bastar (Madhya Pradesh) Mayurbhanj, Koraput (Orissa) Dungarpur, Banswara (Rajasthan) Lohit, Tirap (Arunachal Pradesh) (Total number of districts 12)	12	30
Significant 5-8	Mikir Hills (Assam) Santal Parganas, Singbhum (Bihar) Panch Mahals, Bharuch, Surat, Valsad (Gujarat) Shahdol, Dhar, Kharagcne, Chhindwara, Seoni, Rajgarh (Madhya Pradesh), Dhulia (Maharashtra) Sundargarh, Baudh-Khondmals, Keonjhar (Orissa) South Tripura (Tripura) (Total Number of districts 18)	18	48
Low 2-5	Khammam (Andhra Pradesh) Goalpara (Assam), Palamau (Bihar), Sabar Kantha, Vadodara (Gujarat) Satna, Sinhi, Betul, Bilaspur (Madhya Pradesh) Thana, Nasik, Yeotmal, Chandrapur (Maharashtra) Sambalpur, Bolangir, Kalahandi (Orissa) Sawai Madhopur, Sirohi, Udaipur, Chittorgarh, Bundi, Kota (Rajasthan) West Tripura, North Tripura (Tripura) Darjeeling, Jalpaigun, Purulia (West Bengal) Andaman & Nicobar Islands, Daman (Goa, Daman & Diu) (Total number of districts 31)	31	79

Categories	Districts (State)	Total	Cumulative frequencies
Marginal 1-2	Srikakulam, Vishakhapatnam, Nellore, Adilabad (A.P.) Kamrup, Darrang, Nawgong, Lakhimpur (Assam) Hazaribagh, Dhanbad (Bihar) Shivpuri, Guna, Panna, Rewa, Ratlam, Dewas, Dhandwa, Raisen, Hoshangabad, Jabalpur, Narshimhapur, Balaghat, Durg (Madhya Pradesh) Manipur Kolaba (Maharashtra) Coorg (Mysore) Balssore, Dhenkanal, Gunjam (Orissa) Alwar, Jaipur, Tonk, Jelore, Bhilwara, Jhalawar (Rajasthan)	34	113
	Dehra Dun (Uttar Pradesh) West Dinajpur, Haldia, Birbhum, Bankura, Midnapore (West Bengal) (Total number of districts 14)	14	127
Below 1	156 districts of Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Maharashtra, Kerala, Madhya Pradesh, Mysore, Orissa, Rajasthan, Tamil Nadu, Assam, Uttar Pradesh, West Bengal and Goa, Daman & Diu	156	283
No Tribal	84 districts. All districts of Haryana, Punjab, Jammu and Kashmir, Sikkim and Ponicherry, 29 districts of Urrar Pradesh, 5 districts of Maharashtra, 3 each of Bihar and Himachal Pradesh, 2 in Madhya Pradesh, and 1 district each in the states of Andhra Pradesh, Gujarat, Kerala, Tamil Nadu and the Union Territories of Chandigarh and Delhi	84	367

(Adapted from Raza and Ahmad, 1990 : 71)

It has been clearly established that spatial distribution of tribal population shows clustering in certain ecological niche at North Eastern periphery of the Himalayas, Meghalaya plateau Chotonagpur, Aravallis and Vindhyan uplands in East Rajasthan and Madhya Pradesh, Gujrat and Himachal Pradesh which contain 55 percent of the tribal population. Another 40 percent live in the peripheries of these clusters. Raza and Ahmad systematically proposed region formations in terms of Macro, Meso and Micro on the basis of racial, linguistic, ecology and tribal identity. But there are some difficulties to accept their proposition of such classification in entirety. Firstly, there is no proof of Negrito race in the mainland of India. Secondly, they have accepted outdated scheme of racial biology. Thirdly, language of the communities can be changed over a comparatively shorter span of time. However, in different perspective the proposed schemes are rather encouraging as it carefully suggests some sort of taxonomic classification of tribe without any value loaded concept.

Ecological setting of the tribal people has certain characteristic features : concentrated in the regions which are generally inaccessible and isolated tracts of the country. Such typical tribal habitats are negative to agriculture either due to rugged topography or dense forest growth or both (Raza and Ahmad, 1990 : 94). Consequently, there is a simple correlation between the concentration of tribal population and the environmental parameters.

Table 2.2. *Co-efficients of Correlation.*

Tribal percentage	Area under forests	Net shown area
First quartile (above 38%)	72 *	– 42
Second quartile (15%-38%)	41 *	– 30
Third quartile (10%-15%)	12	– 04
Fourth quartile (05%-10%)	.35 **	– 02

(Adapted from Raza and Ahmad, 1990)

* Significant at 1% level
** Significant at 5% level

The correlation analysis showing in Table 2.2 leads to the following broad conclusions by Raza and Ahmad (1990 : 94-95).

i) The major tribal cluster associated with the forested tracts is best brought out by co-efficient of correlation for the first quartile of districts – Value being .72 which is highly significant.

ii) The co-efficient of correlation for the second quartile also shows a significant relationship (r = .41)

iii) The net shown area and the tribal proportion are negatively correlated, is definitely brought out by this exercise.

PENINSULAR INDIAN TRIBAL BELT

The peninsular Indian tribal belt, which encompasses the middle segment of the plateau from the Sahyadris and the Aravallis in the West to the Rajmahal hills in the east.

The mid-Indian tribal belt is characterised by a typically monsoon type of climatic regime. The wet and dry regime has an interesting spatial pattern from semi-arid conditions in the Aravallis to sub-humid conditions in Chotanagpur. Most of the annual rainfall comes in the summer moths, June to September. The Western slopes of the Aravallis are relatively rainier. The climate acquires a definite humid character east of Bundelkhand, with the length of the growing season increases and the thick growth of forests promotes tribal dependence on them.

NORTH EASTERN INDIAN TRIBAL BELT

The entire north eastern region has a typical monsoon type of climate. However, variation in altitude results in variations in temperature conditions. The rainy weather lasts here much longer than in other parts of India. The natural vegetation is characterized by tropical evergreen and semi-evergreen forest types. The original vegetation has suffered from indicriminate felling for timber and for jhum or other forms of agriculture.

As sub-Himalayan North West part of Indian territory seems not to be significant from the point of view of tribal concentration, the tribal area are mainly confined to peninsular region and

JC4 405

the North East India. On the basis of geo-climatic, demographic and cultural background tribal majority areas are classified into three different zones or border zones as shown in Table 3.

Table 3. *Distribution of Indian Tribes in different zones.*

Zone	States/Areas	Dominant Tribes	Percentage
North Eastern	Assam, Manipur, Tripura Nagaland, Meghalaya, United Mikir & North Cachar Hills	Naga Group (Konyak, Rengma, Sengma, Ao, Angami, Lhota, etc) Kuki group, Lushai, Lakher, Khasi, Garo, Kacharij, Dala, Mikir, Apatanis, Padam, Minyoung Lepcha, Bhutia, Rabha.	11
Central Zone	West Bengal, Bihar, Orissa, M P , U P , H P , Punjab, Haryana, Rajasthan, Gujrat, Maharashtra.	Santal, Munda, Oraon, Bhumij, Kora, Lodha, Juang, Khond, Korku, Gond, Bhil, Birhor, Kol, Maler, Asur, Baiga, Pradhan, Birjhia, Agaria, Hill Maria, Bison-horn Maria etc	82
Southern	Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Daman & Diu, Andaman & Nicobar Islands, Pondichery, L M A Islands.	Chenchu, Toda, Badaga, Kota, Panian Irula, Kurumba etc. Some district tribal communities are also found in some pockets like Andaman and Nicobar Islands, Laccadip etc The hostile Jarwa, Nicobarese, Onge, etc. are notable for their primitive style of life	7
			100

Differential socio-economic conditions of tribal zones of Central India and North East India is evident from the Table below,

Table 4. *Living condition of Central and North East Indian Tribes.*

	Average size of family	Literacy percentage (Male + Female)	MPCE percentage Rs. 125	land holding hectare	Asset liabilities ratio debt/asset.
Central India	4.82	32.6 (31+11)	69.1 Rs. 132	1.20	2.58
North East India	5.22	51.7 (59+39)	31 Rs. 211	1.54	1.24

(Source : NSSO, 1990)

GS 5030

The Table 4 clearly demostrates the degree, of variation that is existing between these two broad tribal zones. The disparities can also be traced in each variable : average family size is larger among the tribes of North East India, being 5.22, than that of the tribes of central India, which is 4.82. Rate of literacy shows marked differences for both the regions, i.e., above 19 percent. Literacy rate is 32.6 percent among the tribes of Central India whereas the corresponding figure is 51.7 for North East India. It is more marked with female litreacy rate of the tribes of Central and North East India zones. In case of former, female literacy is 11 percent end of the later the corresponding figures is 39 percent. Therefore, there is a difference of 28 percent female literacy between Central and North East India. Discrepancy is also comparatively high in respect to "Monthly per capita consumer expenditure" (MPCE). The tribal people of North East India are quite better of. The average monthly per capita consumer expenditure is Rs. 211 against that of the tribals of central India whose MPCE is only Rs. 132. Moreover above 69 percent of the Central Indian tribal people have a MPCE of Rs. 150 or less whereas only 31 percent of the tribes of North East India have a MPCE of rs. 125 or less. There is difference in land holding pattern. An average area owned by a household is 1.20 hectares for central India and corresponding figure is 1.54 hectares for North East India tribes. It is worth mentioning that percentage of landlessness is quite high. Among the tribes of Central India it is 21.7 against 6.6 percent for the tribes of North East India, Even in livelihood pattern stark difference can be discerned :

Table 5. *Percent distribution of Broad Livelihood class among the Tribes of Central and North East India.*

	Self employed Agriculture	Non Agricultural	Rural labour	Others
Central India	41.9	2.1	49.1	6.9
North East India	76.1	2.4	8.5	13.0

(Source : NSSO, 1990)

About 42 percent of the Tribal people of Central India are self employed in agriculture. Percentage is 76 for the tribal poeple of North East India. 49 percent Central Indian tribal population are engaged as wage paid manual labour viz., agricultural labour, plantation labour, labour in mining and quarrying and labour in manufacturing and construction. In case of North East India only 8.5 percent tribal people are rural labour. In land holding pattern it is found that about 22 percent Central Indian tribal families are landless whereas less than 7 percent North East Indian tribal families do not have any land (Table 6).

Table 6. *Land holding pattern among the Tribes of Central and North East India.*

	Average Area owned ('00 he)	Percent of landless	Percent of holdings (household tribe)
Central India	1.20	21.7	39.8
North East India	1.54	6.6	45.7

(Source : NSSO, 1990)

Asset liabilities is a good measure of wealth and has its bearing on level of living condition of a household. The debt asset ratio reveals the account of debt of a family per Rs. 100/- worth assets of the family concerned. Thus, the larger the value of the ratio, the greater is indebdtendness of the family. In case of Central India the amount of debt is 2.6 percent of the total assets of the family concerned. The average value of asset holding per family in Central India is Rs. 27,000/- and the corresponding figure among the tribes of North East India is Rs. 35,200/-. The difference is more marked when percentage of indebted family between the tribal zones are compared (Table 7).

Table 7. *Asset and indebtness among the Tribes of Central and North East India.*

	Average Asset (in Rs.)	Percentage of indebt families	Debt-Asset Ratio
Central India	27000	21 5	2 58
North East India	35200	4 8	1 34

(Source . NSSO, 1990)

It is evident that there are 22 percent indebted tribal families in Central and 5 percent in North East India.

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A Study on Congenital Malformations among Neonates of Calcutta

A. R. BANERJEE AND A. K. HATI

ABSTRACT : In the present study an attempt was made to find out the overall incidence of congenital malformations among the single born neonates of Ramkrishna Mission Seva Pratisthan for the period 1935 to 1980. Birth records of the above mentioned period were consulted which yielded information of 171117 single borns out of which 954 babies (males–495, females–438, intersexes–20 and non-recorded sex–1) were found with congenital malformations of various types. The overall incidence of congenital malformations was thus found to be 5.58 per thousand single births

Although the specific types of malformations were found to be strikingly different from one another inspite of that the overall incidences of talipes, cleft lip and/or cleft palate, anencephaly were found to be higher than other malformations The incidence rates were found to be increasing over the decades during the last 46 years.

INTRODUCTION

The biogenetic significance of congenital malformations and its relative incidences in different populations formed the subject matter of study of a number of authors from India and abroad. It is interesting to note that most of the incidences of congenital malformations as reported from different parts of India,[1-12] were appreciably higher than the overall incidence of 12.07 per thousand births as reported from 24 W.H.O. centres.[13] In contrast to the above, overall incidence (0.8-4.34 per thousand births) of congenital malformations in Calcutta,[13-16] was found to stand not only below the incidence rates of different parts of India but also the rates of 24 W.H.O. centres. Findings of Ghosh et al[16], however, were quite different in this report.

The lower rate of congenital malformations in Calcutta as compared to other cities of India, thus appears to be noteworthy and requires a thorough investigation with larger amount of data as it has already been pointed out by Stevenson[13] that data on at least 10,000 consecutive births from a centre are desirable to form an idea on the incidence of even the common type of malformation.

With the above idea in view, an attempt has been made in the present communication to present a picture of, a) overall incidence of congenital malformations, b) incidences of some major specific malformations and c) secular trend in the rates of malformations among the newborn.

MATERIAL AND METHOD

Material for the present study was collected from the labour registers for the period 1935 to 1980 of Ramkrishna Mission Seva Pratisthan, Calcutta.

Detailed informations of 1,73,037 pregnancy outcomes (single births–1,71,117, multiple births–1920, including twin, triplet and quadruplet) were available from the register. The bio-social and clinical conditions of the mother and the baby were also noted from the record.

In the present communication, the congenital malformations of the single born babies were dealt with; findings on the congenital malformations of the multiple births will be communicated subsequently.

RESULTS AND DISCUSSION

It was evident from the analyses that out of 1,71,117 single born babies, 954 were malformed (males–495, females–438, intersexes–20 and non-recorded sex–1). Overall rate of congenital malformations among the single borns was thus found to be 5.58‰ (per thousand), during the years 1935 to 1980. (Table I)

The total number of single births and the rate of congenital malformations per thousand single birth per year (during the period 1935 to 1980) has been presented in figure 1. It will be evident from there that there exists some fluctuations with a tendency of very slow increase in the incidence rate of malformation over the years from 1935-1980. The overall rate (5.58‰ births) for the periods between 1935 to 1980 is thus slightly higher than the rates reported earlier from Calcutta,[13-14] but appreciably lower than the overall the rates reported from 24 W.H.O. centres.[13]

Following Neel[17] and Niswander et. al.[18], the incidence rates of different types of specific major malformations, observed either singly or complicated with other abnormal conditions among the single born neonates have been presented in table II. It will be evident from there that although rates of specific malformations are strikingly different from one to another, the overall incidence rates of talipes, anencephaly and cleft lip and/or cleft palate anomalies are found to be higher than the others.

An interesting picture emerges out when the different types of malformations are grouped together systemwise following Neel[17] and presented in table III. The incidence of malformations of musculo-skeletal system is seen to be occurring in the highest frequency (2.07‰) followed by the malformations of nervous system (1.02‰) and alimentary system (1.02‰).

The slow increasing tendency of malformations over the years could be well appreciated when the data presented in figure 1 are grouped together by ten years interval (table IV and figure 2). A sharp and significant increase (t=9.89) of malformation rate from 2.34‰ for the period between 1935 and 1944 to 9.32‰ for the period between 1975 and 1980, through the rate of 4.96‰ and 6.00 ‰ for the periods between 1955 and 1964, and 1965 and 1974 respectively, is well marked.

At the present stage of work, it will be too premature to draw any definite conclusion on the above findings. Number of factors might be involved for the above mentioned phenomena of increase of the rate of congenital malformations over the years. More intensive study with additional method of approach is needed to understand the phenomena more clearly.

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Table I. *Incidence of congenital malformations in single births at Ramkrishna Mission Seva Pratisthan, Calcutta (1935-1980).*

Years	Total single births	Congenital malformed, single births				
		Male	Female	Intersex	Non-recorded sex	Total
1935 to 1980	1,71,117	495	438	20	1	954
	Rate per 1000 single births	2.89	2.56	0.12	0.006	5 58

Table II. *Major Malformations (with or without associated anomalies) among single borns.*

Total births : 1,71,117

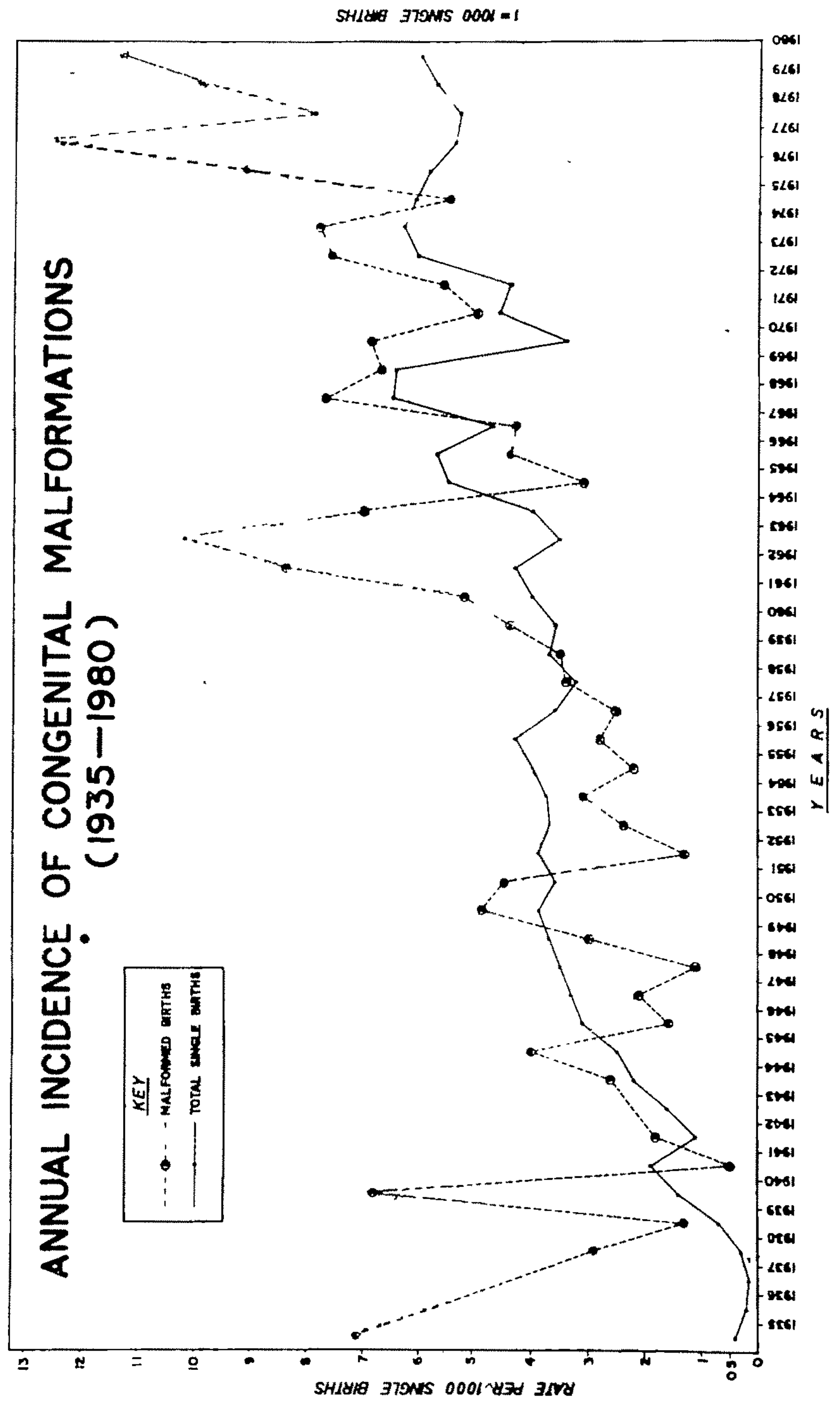
Sl. No	Type of major malformation	Single malformation				Associated anomalies					Grand Total	Rate per 1000 single birth
		Male	Fe-male	Inter sex	Total	Male	Fe-male	Non recorded sex	Inter sex	Total		
1.	Talipes (all types)	94	98		192	14	11	1		26	218	1 27
2.	Polydactyly	34	15		49	5	4			9	58	0.34
3.	Imperforate anus	14	10		24	6	2	2		10	34	0 20
4.	Cleft Lip	40	33		73	1	5			6	79	0 46
5.	Cleft palate	8	8		16	1	2			3	19	0.11
6	Cleft lip & cleft palate	29	17		46	6	2			8	54	0.32
7.	Anencephaly	36	49		85		4			4	89	0 52
8	Hydrocephaly	20	14		34	5	6			11	45	0 26
9.	Microcephaly	3	7		10		3			3	13	0 08
10.	Meningocele	13	12		25	7	7			14	39	0.23
11.	Spina bifida	1	7		8	1	2			3	11	0 06
12	Anophthalmos/ microphthalmos	4	1		5	3	2			5	10	0 06
13.	Cardiac anomaly	3	2		5	1	1			2	7	0.04
14.	Omphalocele	5	4		9	3	2	6	1	12	21	0 12
15	Hypospadias/ Epispadias	12			12	7				7	19	0.11
16.	Monster (Gross)	9	16		25						25	0.15
17	Inter sex			11	11						11	0.06
18.	Ill-defined states	110	92		202						202	1.18
	Total	435	385	11	831	60	53	9	1	123	954	5 58

Table III. *Systemwise Distribution of Malformations*

Sl No.	System affected	Sex involved					Rate per 1000 single births
		Male	Female	Inter sex	Non-recorded sex	Total	
1	Musculo-skeletal	186	168			354	2 07
2.	Alimentary	98	75		1	174	1.02
3.	Nervous	78	97			175	1 02
4.	Cardio-vascular	3	2			5	0 03
5.	Respiratory	–	1			1	0.006
6.	Uro-genital	29	–	11		40	0.24
7.	Integumentary	16	10			26	0 15
8.	Organ of special senses Eye	10	2			12	0.07
9.	,, Ear	6	6			12	0 07
10	Ill-defined states, affecting several systems	69	77	9		155	0 91
	Total	495	438	20	1	954	5.58

Table IV. *Temporal trend in congenital malformations over the decades*

Decades	Total number of single births	Total number of of malformations	Rates per 1000 single births
1935-1944	10243	24	2.3431
1945-1954	34762	98	2 8191
1955-1964	38249	190	4 9675
1965-1974	53424	321	6.0085
1975-1980	34439	321	9 3208
1935-1980	171117	954	5 5800


ANNUAL INCIDENCE OF CONGENITAL MALFORMATIONS
(1935—1980)
KEY
MALFORMED BIRTHS
TOTAL SINGLE BIRTHS
1 = 1000 SINGLE BIRTHS
RATE PER 1000 SINGLE BIRTHS
YEARS
0
0.5
1
2
3
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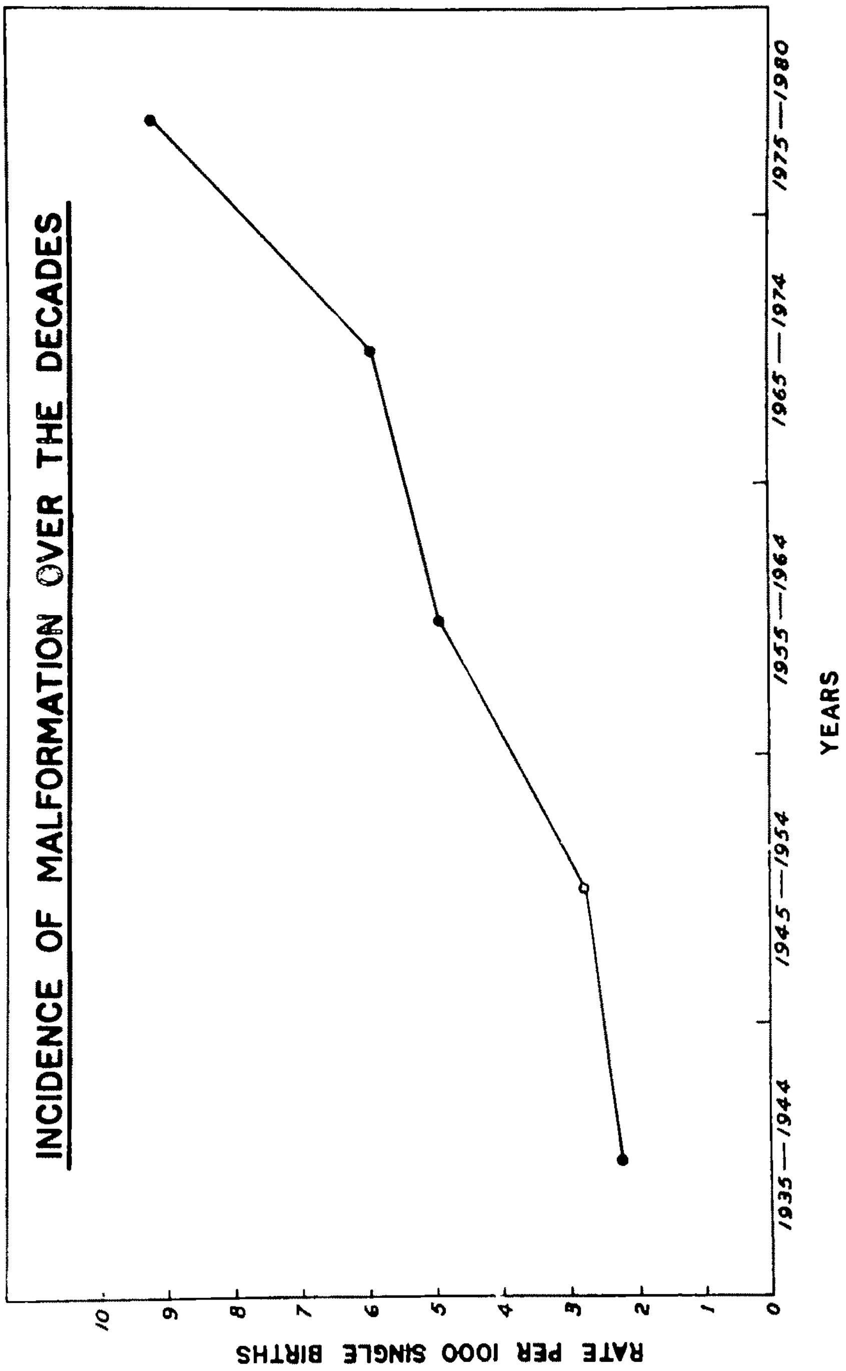
INCIDENCE OF MALFORMATION OVER THE DECADES
RATE PER 1000 SINGLE BIRTHS
0
1
2
3
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5
6
7
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YEARS
1935—1944
1945—1954
1955—1964
1965—1974
1975—1980

Anthropological studies in India : Focal Point on Human Evolution

ASOK K. GHOSH

ABSTRACT : Hcminization is a process of human evolution. Mio-pliocene beds of Siwalik had yielded ample fossil materials to suggest that the subcontinent of India played a metal role for the primate evolution. Significance of India for the study of human evolution is emphasised

PREAMBLE

Human evolution is often considered both in scientific parlance and common discussion. It is to be found out whether it has any relevance in scientific pursuit. These two issues, the system and the knowledge, are really fundamental in nature. Despite this any expression on the same topical problem has not been aptly made so far in discrete and direct form. To begin with this undertaking, the above issues have been dealt with in brief but comprehensive way.

Evolution is primarily a biological process in which a number of factors are responsible, and some of them are inorganic in form. The emergence of a new product from the preceeding stage through change is the ultimate result. Time dimension plays an essential role in the total process. Through the application of the principle of evolution man has emerged. In fact, a non-human ancestral group, through slow but continuous change with a very wide time coverage, gave rise to another group which were provided with partial human characters, and finally, following the same process man came into existence. It is quite obvious that in both the cases there were generalized similarities and at the same time distinctions were met with in micro details, both of factors and the actions thereof. This group made continuous changeover and the final outcome may be considered as the product of the process of hominization (Howell, 1964).

With regard to the relevance of such studies there are at least two major explanations. First one is related to scientific pursuits and the other is pertaining to metrphysical explanations. The former is for the quest of knowledge and the endeavour for the same brings out the facts and figures. These accentuate through time and give rise to surfeit of data. The data in turn present results, although, the interpretation is not expected to be equivocal. Studies on evolution is not only pointed towards man, but similar studies are being made on horse, elephant and many a species of the animal kingdom In the present case, man is primarily considered as an animal, of course added with his other characteristic features. For the possession of the same, he is distinguished from all other animal species.

The philosophical principles related to human evolution is never set, without the coordination of biological mechanism Any human group or community of the present day, in any parts of the world, is the ultimate product of human race evolved from its very inception. It appears to be striking to observe that each individual generation is accumulating twofold information – one from the proceeding group as tradition, and the other relates to experiences, in terms of norms and values of the considered group itself. Group information are the agglomerate of experience and knowledge of a large number of members of the group. In a way, the accumulation of experiences is both quantitative as well as qualitative. It is to be noted that in general the qualitative part transmits through refinement and thereby quantitative comonents are either added or eliminated. Although overall cumulation is always found to persist, but relatively unnecessary traits are left out

In case of patterned chronological occurrence of data, mainly palaeontological materials, changes are observed in the major areas. They are crania or container of brain, teeth – especially canine and molars, lay out of vertebral column, mechanical devices for power and precision hand-grips, structure or pelvis etc. All these features of changeover brought about the stage of bipedal locomation with free hands. Again, another basic breakthrough came in the process of adjustment with extrasomatic functions. The latter transformation is termed as culture which is a special landmark in the process of hominization vis-a-vis culturalization.

PROBLEM PROPER

In the forementioned part a brief account has been mentioned about hominization process in its comprehensive totality. Initiation of the same made its appearance as early as Mio-Pliocene period, roughtly about 15 million years back. From then on, evolution of primates continued, perhaps in ramified nature. In this regard, the subcontinent of India, more especially the Siwaliks, played a significant role as one of the main centres, both of primate evolution and radiation.

Works along this line were initiated during the last century, and most of the contributions were naturally made by the geologists (Lydekker, 1879, 1886; Pilgrim 1910, 1913), who were often engaged in the field for the purpose of collecting data on palaeontology and stratigraphy. These studies were carried out focussing on the palaeontological view point. In addition to the same, information on geochronology and palaeoenvironment were taken into account as works of additional interest.

Much later, practically in the second half of this century those initial data were re-examined and reviewed by anthropologically oriented palaeontologists (Simons and Pilbeam, 1965). These works made an impact from the evolutionary point of view, added with the cultural characters. Here cultural features have been labelled as parabiological attributes. Genesis of the former facts lies within the fold of holistic biology – both structural and functional.

Man is characterised in very many ways from other higher primates on the basis of anatomical and morphological feature and so also the biochemical and genetic makeup. Inspite of the fact, the role of culture, governed by biological capabilities may be considered as the most important distinguishing trait of identity (LeGros Clark, 1950; Ghosh 1969). At least from this point of view one of the basic features on foundation of human evolution is basd in Anthropology, especially with its metods and techniques, and so also results and interpretations. From this perspective, the issue related to human evolution can not be set aside from the fold of anthropological studes. Pursuits of this nature have been carried cut on Indian situations, of course with Indian materials. In the present case a brief review of the same has been attempted in historical frame and with anthropological dimensions.

MATERIALS

Majority of the fossil materials have been properly studied with due attention on the finds, locality, geostratigraphic horizon and the nomenclature both original (herein within parenthesis) and modified version. For the purpose of minimum parity, a brief review on the available information has been incorporated here.

1 (D 198) Ramnagar, Chinji horizon, hinder part of the left ramus containing M_2 and M_3, *Sivapithecus middlemissi, (D. indicus).*

2. (D 177) *Chinji zone,* broken mandible with M_3, M_2, M_1 and Pm_4, *(Sivapithecus indicus), D. indicus.*

3. (D 192) Chinji horizon, upper canine *(Sivapithecus indicus), D. indicus.*

4. (D 176) Alipur. Chinji horizon, right lower M_3 *(Sivapithecus indicus), D. indicus.*

5 (YPM 13809) Chinji, a single left upper canine, *(Dryopithecus Lartet* and species *dryopithecus), D sivalensis.*

6 (D 188) in the neighbourhood of Chinji, Chinji horizon, Right upper M_3, *Palaeosimia rugosidens (D. sivalensis).*

7 (YPM 13813), Chinji village, Chinji horizon, an isolated left M_1, *D. cautlevi (D. sivalensis).*

8. (D 179), neighbourhood of Chinji, Chinji horizon, left lower M_3, *D. Chinjiensis (D. sivalensis).*

9. (No catalogue no), it is kept in the British Museum – Salt Range – Geostratigraphic horizon not known, third M_3, *Dryopithecus Chinjiensis (D. sivalensis).*

10 (D 180), locality not known – Lower Siwaliks of Chinji horizon, perhaps left M_1, *D Chinjiensis (D sivalensis).*

11 (Am 19411) Ramnagar, Chinji horozon, anterior part of the lower jaw – includes P_3 and P_4, *D. pilgrimi, (D. sivalensis).*

12 (D 118) near village of Chinji – Chinji horizon – lower M_3 and M_2, *D. punjabicus (R. pubjabicus).*

13 (D 181) locality not reported, Chinji horizon, lower molar, *D. Chinjiensis (D. sivalensis).*

14 (D 186) – near Chinji, Chinji horizon upper M_3, *D. punjabicus (R. punjabicus).*

15 (D 187) – near Chinji, Chinji horizon, single left molar (either M_1 or M_2), *D punjabicus (R. punbajicus).*

16. (YPM 13184) – Hasnot, upper Chinji, left ramus – M_2, M_3 and roots of M1 and root of PM_4, *Brahmapithecus thorpei (R. panjabicus).*

17 (D 200) – near Haritalyangar, Nagri horizon, either M_1 or M_2, *Hylopithecus hysudricus* (nomen dubium)

18 (D 175) – Alipur, Nagri horizon – right lower M_3, *D. giganteus (D indicus).*

19. (AM 19143) – locality not known, Nagri horizon – fragment of the mandible – including PM_4, M_1 and M_2, *Dryopithecus frickae (D indicus).*

20 (D 191) Haritalyangar, geostratigraphy not known – left maxilla – with M_1 and M_2, *Sivapithecus indicus (D. indicus).*

21. (D 178) – Haritalyangar, Nagri zone – lower molar. *S. indicus (D. indicus).*

22. (D 190) – Haritalyangar, Nagri horizon, left lower PM_3, *S. indicus (D. indicus).*

23 (D 189) Haritalyangar, Nagri zone – left ramus, lower canine, I_1, I_2, *S. indicus (D. indicus).*

24 (GSI 18065) – Haritalyangar, Nagri zone, isolated upper premolar, *S. indicus (D. indicus).*

25. (GSI 18040) – Haritalyangar, Nagri zone, fragment of the mandible – with M_2 and M_3, *S. indicus (D. indicus).*

26 (GSI 18066) – Haritalyangar, Nagri zone, upper canine, *S. indicus (D. indicus).*

27. (GSI 18070) – Haritalyangar, Nagri zone, isolated molar, assigned to *Sivapithecus* – Simons and Pilbeam's nomen not known.

28. No catalogue no is given by Pilgrim, locality Salt Range, geostratigraphic position not known, an isolated upper molar, M_1 (perhaps), *S. indicus (D. indicus).*

29. (D 196) – Haritalyangar, Nagri zone, Canine, upper PM_3, PM_4, M_1, M_2 and M_3, *S. orientalis (D. indicus).*

30. (D 197) – Haritalyangar, possibly Nagri; C_1, PM_3, PM_4, M_1 and M_2, *S. himalayensis (D. indicus).*

31 (GSI 18039) – Haritalyangar, Nagri zone, I_1, I_2, C, PM_3, PM_4, M_1 and M_2 of the lower jaw, *S. sivengari (D. indicus).*

32 (GSI 18069) – Haritalyangar, Nagri zone, last premolar *S. sivalensis* (not known in relation to Simons and Pilbeam)

33. (GSI 18064) – Haritalyangar, Nagri zone, upper M_1, M_2 and M_3, *Sivapithecus sivalensis* (Simons and Pilbeam's term not known).
34. (ONGC/V/790) Bandal village, Nagri zone, lower canine, incisors, PM_3, PM_4, M_1, M_2, *S. lewsi* – Simons and Pilbeam's term not known
35. (D 199) Haritalyangar, Nagri zone, left ramus, PM_4, M_1, M_2 and M_3, *Palaeopithecus Sylvaticus (D. sivalensis).*
36 (AM 19412) Hasnot, Salt Range – Nagri zone, fragment of the mandible containing PM_4, M_1, M_2 and M_3, *D. cautleyi (D. sivalensis).*
37. (YPM 138 11 or D 294) Hasnot, Lower Middle Siwalik, lower I_1, I_2, C, PM_3, PM_4, M_1, M_2, *Sugrivapithecus salmontanus (D. sivalensis).*
38 (GSI 18067) Haritalyangar, Nagri zone, lower right M_3, *Sugrivapithecus gregoryi (D. sivalensis).*
39. (GSI 18042) Haritalyangar, Nagri zone, isolated molar, *Sugrivapithecus sivalensis (D. sivalensis).*
40. (GSI 18041) Haritalyangar, Nagri, an isolated molar. *Sugrivapithecus. (D. sivalensis).*
41. (YPM 13807), Haritalyangar, Nagri, upper M_1 and M_2, *R. bariensis (D. sivalensis).*
42. (GSI D-1), Jabi-supposedly Dhok Pathan, palate with I_1, I_2, C, PM_3, PM_4, M_1 and M_2, M_3, *Palaeopithecus sivalensis (D. sivalensis).*

The above noted materials are the representative samples. In recent times, more materials have been discovered. The latter group of materials could not have been included here due to paucity of available data necessary to deal with.

SPACE COVERAGE

From the distribution of sites it appears that all the finds are located in the geo-political areas of India and Pakistan, with concentration only aong the catchment basin of the major tributaries, viz. Beas, Ravi, Chenab and Jhelum, of the Indus system (Sen, 1978), within the present altitude between 300 and 1200 m. However, the distribution of materials is higher within the altitude from 300 to 600 m. In exceptional cases, it exceeds 1200 metre (Sen and Ghosh, 1978). The distribution in the latter area may be explained as due to temporary migration.

It is not really known why the specific area, at least in terms of altitude, was used for the purpose of habitation. Without knowing the details of the reason, it may still be said that the said area was definitely more favourable for living. In this case living is maintained by hunting and gathering activities. It is to be borne in mind that the same area was also the congenial abode for other animals which served as the games of the hominoids. Similary, food was exploited from plant resources. No confidently reliable information have yet been culled on palaeoclimatic data, except a few attempts, as of Badgley of Behrensmeyer (1980). Availability of the same will assist to correlate between physical environment and its suitability in terms of the multiplication of the hominoids, especially the genera and species which used to live in this area.

CHRONOLOGICAL SPECTRUM : The dating of the finds are mostly reported in terms of different geological system and formations of the Siwaliks which include from the upper part of the lower Siwaliks to upper part of the middle Siwaliks. Thereby the total coverage is still middle miocene to lower Pliocene. The major stages are Chinji, Nagri and Dhok Pathan. The bio-stratigraphy (Tattersall, 1969a, 1969b) indicates a tentative absolute dating from 15 to 5 m.y., of course a detail investigation on chronology is indeed essential. In the global perspective a number of dates of the Tertiary hominoids has been estimated from the works of Andrew and Toblen (1977), Munthe et. al. (1983), Barry (1986), Kappelman et. al. (1991) etc. With specification to South Asia the range of date for the bulk of the hominoids is 7 to 8 m.y. (Sankhyan, 1985). The palaeomagnetic dating of the Siwalik stratigraphy (Johnson et. al., 1983) has opened a new vista on the chronological aspect related to hominoid evolution.

Genus and Species Distribution : Below the Chinji stage a few finds have been reported with considerable amount of doubt. In case of Chinji stage, most of finds are *Dryopithecinae,* while in Dhok Pathan stage, only *Ramapithecus* materials have been yielded, exception is also met with in connection with *Gigantopithecus bilaspurensis.*

The intermediate stage known as Nagri is practically playing a role of an amalgam in which both *Dryopithecus* and *Ramapithecus* have been found in co-existence. In recent times new interpretations have been presented on the problem of variation and change between and among genera and species and so also the distinctions due to sexual dimorphism (Sankhyan, 1990, 1991).

On the basis of the above materials and their analysis, especially on dental materials, it is proposed that the Chinji stage is of rainforest condition (Pilbeam, 1972; Simons, 1972) – suitable area for the habitation of *Dryopithecinae.* During Dhok Pathan stage there was complete grassland savannah – which served as habitat for the *Ramapithecus.* In between the two extreme conditions there was the stage of changeover from rainforest to grassland during the Nagri stage. This break gave rise to the emergence of *Ramapithecus* and change in environmental condition made on impact in genus and species differentiation.

About genus and species a considerable amount of controversy prevailed for a long period have specially till 1965, when Simons and Pilbeam (1965) presented a revision. In accordance with the same, the types are *D. indicus, D. sivalensis, R. punjabicus.* In addition to the same the single find of *G. bilaspurensis* may also be included.

The solution was not achieved with the forementioned revision and our work (Ghosh and Sen 1980) shows that *Dryopithecus* is the basic form in which *Ramapithecus, Palaeopithecus* and *Palaesimia* may be included. Additional provision in the genus level should be made at least for *Sivapithecus* and if possible to *Sugrivapithecus* which are related both ways with Dryopithecus and Ramapithecus. The relationship, especially between *Ramapithecus* and *Sivapithecus* does not mean only of two genera but also their proximity. The proximal similarities may be expressed in various ways and sexual dimorphism is one of the forms, which is believed by Sankhyan (1991). I personally neither disagree on this interpretation nor I agree to the fullest extent due to constraints with the materials already available.

About *Gigantopithecus,* it is very difficult to make any final conclusion at this stage. Despite the fact, it is suggested that it is more akin to *Homo* and the giganteus element may be explained either as an aberrent type or a conspicuous character of sexual dimorphism.

Anthropological studies in this area was initiated quite early although the rate of progression is very weak. Like eastern Africa, this part of South Asia contains a great and rich treasure of materials essential for clear understanding of the evolution of man in its inception. A thorough work is necessary for on-spot survey, collection of materials, identification of geological stratigraphy, discerning the chronology and piecing together the material for framing the phylo-taxonomy of late *Hominoids* and early *Hominds.* Within the last four decades more materials of hominoids have been discovered from different places. New methods and techniques have been devloped and with the application of the same, new results have made breakthrough. In real sense of the term, the root of human evolution is laid on the genesis of hominoids. In this regard, India is placed on a significant place with the materials, giving rise to importance of this area in the study of evolution of man.

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The Concept of Mesolithic Stage and an example from Eastern India

RANJANA RAY, UJJAINI BASU & ASOK K. KUNDU

ABSTRACT : Mesolithic as a concept emerged in Europe although the origin of the term is related to findings from the central Indian hilly tracts. The term varies in use and connotation in Europe, Africa and Asia. India has yielded a wealth of data on mesolithic but the terminological concept is still vague. This is due to lack of proper dating. A mesolithic site is discovered from Orissa near Joshipur. An account of its findings are given in this paper.

THE CONCEPT OF MESOLITHIC

The historicity of the terminology "Mesolithic" is an overall expression of results acquired through data placed in spatiotemporal dimensions and the interpretations, if any, achieved therefrom.

Credit for coinage of the term Mesolithic goes to Westropp (1866); though he failed to give a proper connotation to the term itself.

In fact the term Mesolithic was properly applied for the first time in an Indian context. A. C. Carlyle (Brown, 1889) who was in Archaeological Survey of India found a large number of small stone implements from Vindhya hill regions of central India. These were mostly found in caves and rock shelters and comprised crescents, trapezoids, triangular forms and delicate knifelets. No tool was more than 1.6 cm. in length. These were never found associated with polished or ground implements. According to Carlyle there was enough stratigraphic evidence for him to suggest that the small implements were intermediate between Palaeolithic and Neolithic and comprise a stage connecting both. Carlyle termed this intermediary stage as Mesolithic. On the basis of Carlyle's finding and similar data from other parts of Asia and Africa led Brown (1893) to investigate similar situation in Great Britain and Europe. He put forward the transitional sequence of axes from cruder to polished from drift or ice age forms to Neolithic forms. He further pointed out continuity in the form of small flakes. His evidence was based on data found near about East Dean, Sussex and it was both on stratigraphy and typology. Despite the evidence and logic put forward by Brown for the terminology the same was not accepted in Europe. This was because of the strong opposition of the contemporary famous geologist Boyd Dawkins (1894). In his reply to Dawkins' paper Brown made his position about Mesolithic very clear.

It was not until Piette's (1895) discovery of Mas d'Azil that the term Mesolithic gained any popularity among the European scholars. Burkitt (1926), Clark (1932, 1936) and Childe (1947) made a proper analysis of the data on post Pleistocene cutlures gathered from different zones. Clark (1932) established the terminology in its porper connotation substantiated with data on geo-stratigraphy, archaeology and ecology. Clark (1932, 1936) shifted his area of enquiry from mere culture to ecological understanding. In the background of changing climate in Europe flora, fauna changed and thereby brought in a changeover in the life style of contemporary people. Clark (1980) defined European Mesolithic in the following manner; it is a culture of hunter-gatherers lying intermediate to Palaeolithic on the one hand and Neolithic on the other, recent in geo-chronology, followed the same subsistence pattern as Palaeolithic but difference was emphasised in terms of specialization. The end of Pleistocene is coventionally placed at 10,000 B.P. The date for

Mesolithic in Europe is fixed around C. 9500 B.P. and the end is marked by the introduction of agriculture in 6000 and 5000 B.P., (Price, 1991). The Mesolithic hunter-gatherers were highly innovative. They adapted themselves successfully to the postglacial environment.

More than often the pioneer workers on Mesolithic in Asia and Africa were European scholars. Their training and experience led them to identify their findings to the European sequence. Garrod (1957) used the terminology to describe the industry found at Natufian and other subsequent Holocene finds from Palaestine.

Subsequent data from West Asia, mainly along Zagros region and Jordan valley revalidated the terminology. The period just preceding Neolithid is called Epipalaeolithic in Middle East. The term is used from 1930 onward by Garrod, Stekelis, Neuville, Kenyon and others (Bar-Yosef and Belfer-Cohen, 1989) and is well established with well documented evidences. The term is also used in north Africa and circum-mediterranean region. Genesis of the culture lies well beyond Holocene period into the terminal Pleistocene, although the major development took place during Holocene period (Lubell, 1984).

Neolithic mode of production was not introduced in Africa until quite late, in date. In area lying South of Sahara hunting-gathering way of life continued well into the historic age. Culture that flourished during terminal pleistocene and continued until recently is known here by the term Late Stone Age (Clark, 1985).

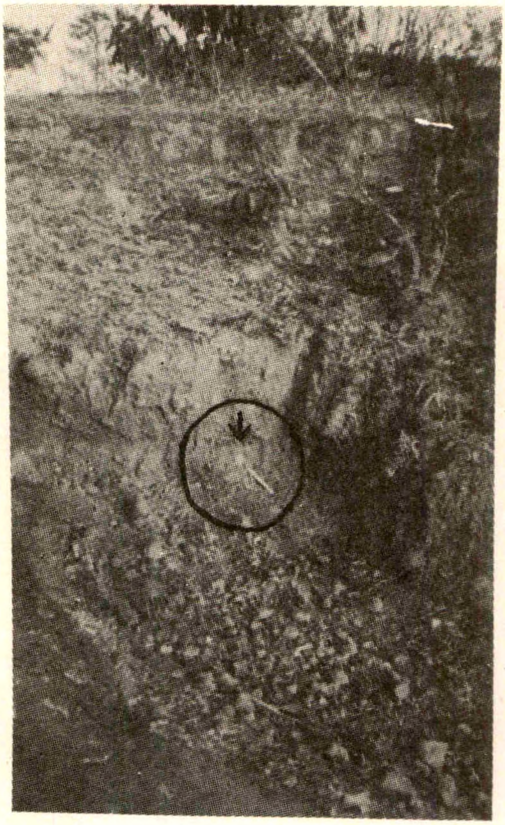
The vast area of Indian subcontinent is conspicuous with the presence of industries belonging to early Holocene period. Terminologies for this cultural phase went through a stage of development. Terms used in India at various times are Late Stone Age (Subbarao, 1958), Mesolithic and Microlithic stage (Sankalia, 1956). At one time there was a proposal for series concept (Sankalia, 1956). The idea was borrowed from Burkitt and Cammiade (1930). The problem of Mesolithic in India lies with the chronolgy, nomenclature and the overall components of culture. Major distinctive criteria for this stage are the microliths. However, Microliths are found from early Holocene industries and have continued into historical period. There is the evidence of size diminution during late pleistocene period (Ray, 1985). This culminated into fulfledged microlithic industry with Blade and bladelets as blanks during Holocene. The excavated Mesolithic sites such as Langhnaj, Bagor, Adamgarh, Sarai-Nahar-Rai and a few others have yielded evidences of the presence of domesticated animals (Misra, 1985). The genesis of Mesolithic culture in India is not fixed with absolute time scale. The culture developed, adapted itself to the regional diversity (Ray, 1985) and continued in some places as cultural backwater.

There is an urgent need for study of the Indian Mesolithic culture with a view to finding out the proper horizons. Perhaps this may bringout the terminological concept in its proper perspective in India.

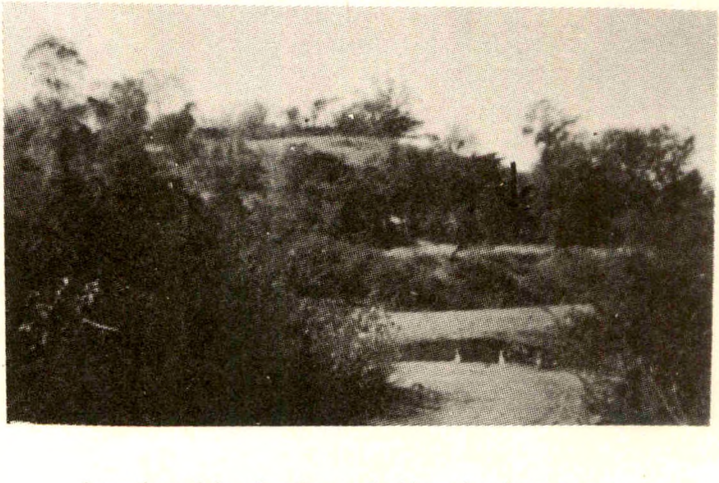
STUDY OF A MESOLITHIC SITE FROM ORISSA

The authors have discovered an extensive mesolithic site on the left bank of river Bhondan opposite to the town Joshipur in the district of Mayurbhanj, Orissa. This area is not totally devoid of stone age remains. Mohapatra (1962) worked near Joshipur and had found remains of early stone age culture. Misra (1983) had found mesolithic remains in the vicinity.

Mohanty (1992) had carried out a review of the work done in Orissa. He had emphasised in his work in the diversity of assemblage pattern in the mesolithic culture which he correlated with



The trial trench showing in situ Mesolithic tools.



Location of the site Gartarshahi on the river terrace diverse activities at different phases of occupation. His major work is in Keonjhar district (Mohanty, 1988). He had come across heavy duty tools, viz. horse-shoe scraper and celt, as well as microlithis. Mesolithic people had shown diversity in adaptation in the background of a broader zone in Eastern India (Ray and Ghosh, 1990). In this context the blade-bladelet elements collected from some regions of West Bengal, Bihar and Orissa were compared. Environmental variation merged with diversity in assemblage pattern.

The present Mesolithic site Gartar Shahi did not yield any heavy duty tool. It is a site where only microliths were found. The artefacts are coming from base of recent geologial horizon.

River Bhondon has got three terraces. These are quite high, but not very wide. The most recent terrace is about 2m wide. At about a height of 6m, the second terrace is situated. It is about 18m at its widest. The third terrace is about 4m high from the second terrace. Microlithis are coming from the second terrace. These are lying on the surface mixed with Ghuting.

A trial trench measuring 2m x 2m was laid on the second terrace. No microlith is found below the ghuting layer. Occurrence of the tools takes place upto a height of about 30cm above the 'ghuting' stratum.

Stratigraphy that is exposed along the wall of the terraces show a topmost deposit of yellowish brown soil lying on a thin bed of 'ghuting' i.e. lime concretions. Below 'ghuting' is a bed of reddish brown soil. Microliths are coming from the lower part of the uppermost bed. From the cliff section exposed along the wall of the third terrace *in situ* collections are made.

Stratigraphy in Orissa had been clearly worked out by Mohapatra (1962). This relates to those of eastern India (Ray and Ghosh, 1990). Overall quaternary stratigraphy consists of alternating beds of gravels and silt. On top of the upper silt a thin bed of 'ghuting' is found at places. The silt lying on top of the upper silt is Holocene in origin Ray (1985). The tools were probably deposited at the beginning of the Holocene.

A total number of 282 tools were collected. 147 tools were from the trial brench and 135 from the surface. The trench was laid where maximum concentration of artefacts were found.

Table 1, shows distribution of types. The site had yielded very rich microlithic types, viz., bladelets without any retouch, blunted back blades and bladelets, points, awls, lunates, trapezes, triangles, burins, scrapers, cores and waste flakes. Highest percent is covered by bladelets (30.85%). 20.54% of the total collection is scraper. Flakes without any retouch is 15.60 percent. Geometric microliths i.e. trapeze, triangle and lunate form a significant part in the collection. Blunted back blade is quite abundant in proportion.

Major part of the tools are microlithic in size. Largest tool is a scraper 6.8 cm in length. No other tool exceeds 4.9 cm in length.

Techniques employed are punch for taking out blades. Fluted cores are in quite a good number. These are the biproducts of punch technique. Blunting is done by pressure flaking method. Minute flake scars are removed by this method. Some blades are with serrated edges. Notched blades are common.

Triangle, trapeze and lunate are finely proportioned. Great skill in workmanship is apparent here. These are considered as geometric types. Presence of geometric types is a technological marker for developed form of mesolithic industry.

Scrapers are sub devided into side scraper, end scraper, round scraper and end-cum-side scraper. Shape of working edge is varied. They are concave, convex, straight and notched. A few have got denticulated edge. Other types such as burin, awl, point are found in quite a good proportion. Large quantity of flakes without any retouch are probably debitage materials.

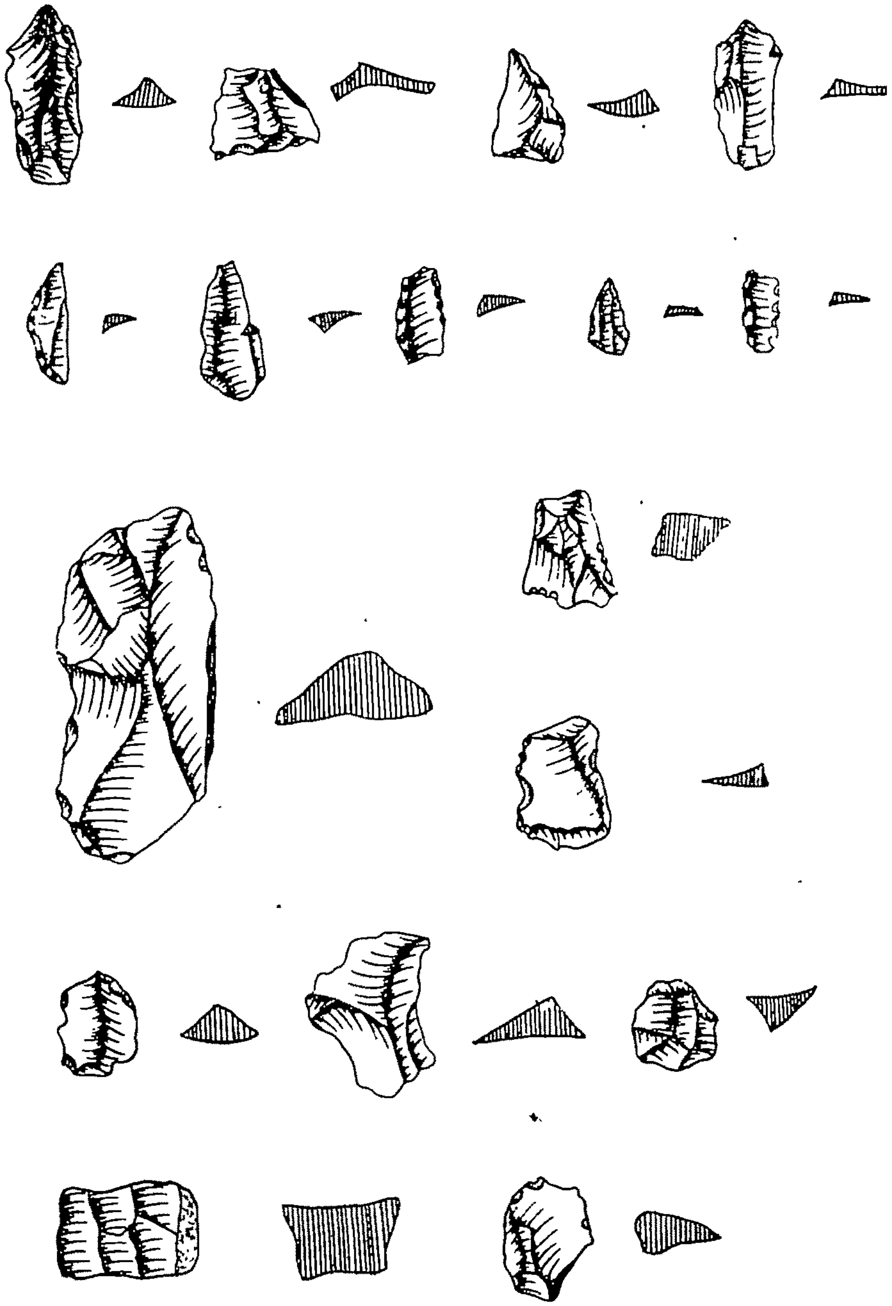
The assemblage is basically microlithic in character. Macro elements are very sparse in occurrence. The industry is devoid of any neolithic or palaeolithic tools. Stratigraphic occurrence too suggest early Holocene date. Lal (1958) excavated mesolithic element in similar circumstance in the second terrace from the river bed on Damodor near Burdwan at Birbhanpur. The assemblage pattern is different. The Birbhanpur material contained more of macrolithic element. Geometric microliths were not significantly present.

Presence of cores, debitage materials and dominance of scrapers perhaps indicate that the site was a workshop area where tool making as well as other functional activities were carried out. The flat surface of the terrace provided with easy accessibility. There is no dearth of raw material and other resources for subsistance. Mesolithic community, perhaps in small bands like that of the present day nomadic Mankria tribes of the region, frequented the site in pursuit of subsistence.

Concept of Mesolithic in India is rich in data on typotechnology, distribution, assemblage pattern, its diversity, adaptation to the contemporary environment and probable livelihood pattern. Evidences are there on the human types but unless there are absolute dates for the beginning, end and different phases of development the terminological problem will not be solved.

Table 1. *Showing Frequency distribution of Artefacts and Gartarshahi.*

				Range of measurements (in cms.)					Range of measurements (in cms.)				
Sl No.	Typology	Trial Trench	%	Length	Breadth	Thickness	Surface	%	Length	Breadth	Thickness	Total	%
1.	Bladelet	55	19.5	2.6-1 4	1 2-0 5		32	11.35	4 9-1.7	2.2-0.7	1.3-0.2	87	30.85
2.	Blunted back blade	9	3.19	1.8-1.1	1 2-0.5	0 6-0.2	15	5.32	4 9-1.7	2.2-0.7	1.3-0.2	24	8.51
3.	Awl	3	1.06	3.3-1 2	1.4-0 9	0.7-0.3	7	2.48	3.0-2.1	2.5-0.7	1.3-0.5	10	3.55
4.	Point	5	1 77	3.0-1.6	1.9-0 9	0.5-0.2	3	1 06	2.5-1.4	1.7-0.5	0.6-0.2	8	2.84
5.	Lunate	3	1.06	2 1-1 7	0.7-0.5	0.4-0.3	3	1.06	2.3-1.6	0.8-0.5	0.4-0.3	6	2.13
6.	Trapeze	4	1.42	1 4-1.2	1 2-1.0	0.5-0.2	1	0.35	1.4	1.4	0.5	5	1.77
7.	Triangle	2	0 71	1 7-1.4	1 0-0.7	0.3-0 2	3	1.06	2.0-1.3	1.2-0.7	0.7-0.2	5	1 77
8.	Burin	6	2.13	2.1-1.4	2.0-1.3	0 5-0.3	10	3 55	3.0-1.3	3.0-0 9	1.8-0.3	16	5.67
9.	Core	6	2.13	3.0-1 7	3.4-2.0	2.6-1.2	12	4.26	2.6-1.6	2.3-0 9	2.1-0.8	18	6.38
10.	Scraper	28	9.93	6 8-1.8	3 5-1.2	1.5-0 4	30	10.64	3 5-1.5	2.5-1.0	1.2-0.4	58	20.57
11.	Waste Flake	26	9 21	2.7-1.0	2.5-1.0	0.4-0.4	18	6.38	3.2-0 9	2.2-0 6	0.8-0.2	44	15.60
12.	Denticulate						1	0.35	2.2	1 5	0.7	1	0.35
	Total	147	52.11				135	47.86				282	99.99



A few representative Mesolithic tools from Gartarshahi, Orissa.
Scale : original

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Agriculture, Technology and Environment

BISWANATH BANERJEE AND SHAKTI PADA HALDAR

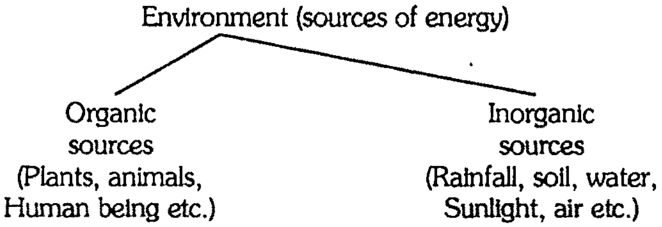
ABSTRACT : Technological adoption in agriculture in the Natagram village, 24-Parganas (North) is studied. Neo-technique in the form of tractor, tube well etc. is entering into agricultural practices. This enables the villagers greater exploitation of environmental resources. Assurance of greater yield brings about drastic change in the socio-cultural life of the villagers.

Man exploits his environment for survival. His supply of food depends largely on plants and animals, either directly or indirectly. In this way man transfers energy from environment. The technique for domestication of plants and animals ensures the transfer of energy. From this point of view agriculture offers a more or less assured way of energy transfer from environment. In this way it may be assumed that agriculture is a mean of accumulating and controlling readily available energy from the environement. An ordered set of activities through which the cultivators adapt to its natural environment is dependent on these sources.

The environment of any place consists of two kinds of sources of energy : Organic (such as plants, animals, human being etc.) and Inorganic sources (such as soil, water, rainfall, climate, sunlight, fuels, metallic ores etc.).

(a) $\text{Environment} \xleftarrow[\text{energy transfer}]{\text{Interacts for}} \text{Man}$

(b)


Environment (sources of energy)
Organic sources (Plants, animals, Human being etc.)
Inorganic sources (Rainfall, soil, water, Sunlight, air etc.)

The nature and type of use of energy sources may vary from time to time, individual to individual, community to community. The mode of utilization of energy sources of the environment dictates the technology concerned. Therefore subsistence-pattern may be defined as a mode of energy transfer through technology with exploition of the readily available sources of energy of the environment.

With such an outlook, the system of energy-transfer from the environment to the peasants, builds up an agrarian ecotype. Basing on this and considering the technology of cultivation in the world from evolutionary view point, Wolf (1966) has identified two forms of ecotype in the agrarian sector : Palaeo-ecotype and Neo-ecotype. In Palaeo-ecotype, the technology followed by the peasants is called palaeo-technique. In this, the peasants have to depend largely on animal and human labour for production. Plough-cultivation is one such type. In the Neo-ecotype, the technology followed by the peasants is called Neo-technique where the peasants have to depend largely on the inorganic sources of the environment and the skills of science; e.g. tractor-cultivation.

(c) Agrarian Ecotype < Palaeo-ecotype
(Utilization of organic sources of energy)
Neo-ecotype
(Utilization of inorganic sources + skills of sciences)

Change in Ecotype indicates change in technology. Change in technology leads to the change in quantum of energy-transfer from environment to man. In other words it indicates change in the production size. The change in the production may be measured in two ways : (i) In terms of productivity, (ii) and in terms of expansion of agricultural cycle, i.e., cropping pattern. Both the ways provide change in the utilization of labour in agricultural operations. This change in labour utilization occurs through the shifting of animal and man-power to machine-power. Thus change in ecotype may provide change in technology. Utilization of machine-power instead of animal results in higher yield.

Natagram is a multi-caste and multi-ethnic agriculture-based village in 24-Parganas (North), about 60 km. from Sealdah, Calcutta. The Jessore Road, passes through the centre of the village. Along this road government and public buses and other public vehicles are regularly plying. This has made the village easily communicable with the city.

The ethnic composition includes castes like Brahmin, Kayastha, Satchasi, Subarna Banik, Mahisya, Jadav, Namasudra, Barui, Dhoba, Karmakar, Tili. Other communities residing in the village are Muslims, Munda and Chasa, Kurmi Mahato. At present, about 46% of the total household of the village depends on agriculture. In the traditional system of caste-bound occupation, people practicing agriculture are Satchasis, Mahisyas and Namasudra. They follow the traditional system of cultivation. The upper caste people who possesses cultivable land employ labourers from the lower caste groups, Muslims and tribals. The cultivation is basically plough and largely dependent on rain. During 1960 and onwards, the inventions of modern agricultural inputs have slowly but steadily invaded the scene. As a result of such inventions, a competetive agricultural market emerged. This provides cash money. The flow of ready cash surrounding agriculture and the availability of more resources from the environment, with the help of new technology, such as, deep-tubewell for irrigation, electricity, shallow – machines etc., influenced people of all the caste and communities to some extent to be involved in the network of agricultural production through adoption of modern (neo-technique) inputs as far as possible for them. In terms of technological adoption, the present situation provides a complicated picture. On the basis of extent of technology used, the people practicing agriculture can be divided into four categories. They are, as follows :—

Gr. I : People who use the Neo-technique inputs exclusively. (17.5%).

Gr. II : People who used mostly Neo-tecnique inputs with a little palaeo-technique inputs. (35%).

Gr. III : People who use mostly palaeo-technique inputs with a little Neo-technique inputs. (27.5%).

Gr. IV : People who use the palaeo-technique inputs exclusively. (20%).

Table I. *Technological Inputs used in Agriculture*

Category	Inputs used	Technology-Type	Ecotype
Group I	Tractor/Powertiller, Pumpset, Deep tubewell, Weeding machine/Manual, Threshing machine/Manual, Husking Machine HYV Seeds, Chemical Fertilizers, Chemical Pesticides, Chemical Weedicides, Chemicals for seed Rectification and preservation, Seed preservation chamber.	Neo-technique	Neo-ecotype
Group II & Group III	Tractor/Plough, Natural Water Resources/Shallow Tube wells, Husking Machine, HYV Seeds/Traditional Seeds Chem. Fertilizer/Organic manure, Pesticides/Weedicides occassionally, No chemicals for Seed Rectification and preservation, No use of seed preservation chamber.	Intermediate technique	Intermediate ecotype
Group IV	Plough, Natural Water Resources Husking Machines, Traditional Seeds, Organic Manure, No pesticide or occassionally, No seed rectification chamical, No seed preservation chamber.	Palaeo-technique	Palaeo-ecotype

Table I shows that the dependence on organic sources of energy of the environment decreases with changing ecotypes. It reaches the maximum in Palaeo-ecotype, where as, it is minimum in the Neo-ecotype. This leaves an intermediate position where dependence on organic sources as well as inorganic sources remain side by side in varied proportion.

Such type of technological adoption in agriculture provides a wide range of agricultural seasons refering changes in the system of cropping-pattern. This depends primarily, on the nature and type of cultivable land and secondarily, on the nature and degree of use of technology. It is obvious from field data that neo-technique cultivation supports multiple-cropping mostly; whereas, palaeo-technique cultivation permits in most cases mono-cropping and in some restricted cases double-cropping. The intensity of production depends upon the nature and use of the ecotype. It is supported by the fact, that in the same environment at least three forms of ecotype have been found. In terms of technology used, they may be named as (a) Neo-ecotype (b) Intermediate ecotype and (c) Palaeo-ecotype. Therefore, it is apparent that the quantum of energy-transfer from environment to the peasant, in the same environment, depends on the ecotype with which the peasants are involved.

Table II. *Ecotype and cropping-pattern*

Sl. No.	Ecotype	Cropping-pattern				
		Kharif	–	Summer	–	Rabi
1.	Neo-ecotype	Paddy	–	Jute	–	Paddy
2.	Intermediate Ecotype	Paddy	–	X	–	Paddy
3.	Palaeo-ecotype	Paddy	–	X	–	X

Table II shows that the intensity of production on the same plot of land largely depends on the nature of ecotype. This is measured in terms of the expansion of agricultural cycle. It may be said that the system of energy-transfer from environment to the peasant and the degree of such transference is more assured with changing ecotypes i.e., from Palaeo-ectotype to Neo-ecotype. There is a marked increase in quantity, which is roughly estimated in terms of productivity.

It is found that with the evolution of agricultural technology, shift from one ecotype to the other is provided with a better assurance of energy-transfer from environment to the peasant. This results into more and more alienation from the organic sources of the environment. Thereby a scope for producing a new type of socio-natural environment emerged where the people seem to find a continuous and increasing gap with his natural environment.

Moreover, this change in technology and ecotype marked by developed system of communication, has invited the regular market within the village. Gradually the old Weekly Market system is pushed out. Economic polarisation is becoming more sharp and accumulation of wealth to a particular class of people is becoming obvious. Life is becoming fast. Traditional social-cultural life is affected by it. Thus the environment is exposed to a drastic change.

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Rethinking an Anthropological Study in an Indian University

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ABSTRACT : Certain arguments have grown out of the experience of the authors for rethinking the individual anthropological studies and reducing some uncared-for, but highly relevant contexts belonging to the reality. The consequent idea of reconstructing the reality of certain study in terms of anything having bearing on it has been anthropological study-cum-training. The study of the mixed tribe-caste village situated in the neighbourhood of an urban industrial locality of Bihar was accomplished by a group of student-investigator and their teacher of the University of Calcutta It has been selected as the case exemplifying the transmission of the contemporary investigation practices of a university of a post-Colonial Third World Country. The critical explanatory framework in the review of the study, emphasises the methodological and ethical understanding of the investigators. The depiction of the operation of power, the impacts of the criteria like the prevailing understanding of the ethnography, the quality of methodological application, the nature of involvement of the investigators and the resultant indifference of them towards the reality etc. on the collection, formation, and categorisation of the data and on the people are supposed to bring out finally the effective trends and traditions comprising the study.

Of an anthropological study something beyond the presented coverage of the society or the culture remains pertinent to the experience of the anthropologist. In many cases they are not seriously considered and at times completely discarded as they do not belong to the objectives of those studies. If this orientation turns into a tradition of ignoring the signifance of certain aspects of labour associated with that particular work of investigation, it may also result in some reductionism. The present authors are attempting to think up an explanatory framework in which the possible aspects of reductionism in a study may be discerned. It is also intended to show how the undercared elements can be given focus and a study can be rethought in some meaningful contexts (Winch 1964).

This understanding may convincingly usher in the reconstruction of the boundary of the presentable empirical reality of a study. The experience uncared-for may be provided with the necessary and meaningful underpinnings so that they can recover their correlations with the coexistent and recognised experience. This merging of the aspects of reality or the enlargement of the presentable whole of the reality is supposed to widen the scope of a study. Therefore, the redefined reality under concern comprises of the usually presented and usually suppressed domains of data regarding the study, the methodological experience behind them and other seemingly relevant and irrelevant aspects of the associated reality. They actually exist not in such completely separable realms of manifestation, but as an interrelated whole. There is always an actual sequence of events in such a study. At the time of writing, the sequence of the whole is distorted for the sake of the objective of the work. Methodologically the objective may range from certain theoretically deduced framework to the empirical reconstruction of the data. The distortion even can not be a rootless affair. Thus, a whole order of anthropological practices in a study is organised at different levels; the order, observable as an extention from somewhere in the entry into idea of a study to somewhere after its final writing has numerous relations with the previous anthropological practices and has an in-built ability to set up a continuity for the future. The intelligibility and viability of any anthropological text indicate that the differentiation of the actual sequence of knowing a society into some determined categories or the distortion of the sequence is not invalid. The validity may be said to have reinforced if the processes of obtaining data and of categorisation of data are sufficiently unveiled. All the authentic writings follow certain processes of obtaining the data and their categories (Achroyd and Hughes 1981).

The present authors bear out the idea that any empirical study as a whole or its elements have obvious relations with the broader social-cultural milieu. The experience of the authors also evokes the thought that some processes due to their functional premises have gained such momentum that they exercise major control over the continuity of the anthropological practices. In the potential forms of tradition they, obviously influence the outcome of the fieldworks and become a part of the reality under concern. These processes have their own factors for continuity and so own choices for organising and shaping the reality of a study (Barnes 1982, Gadamer 1975, Nagel 1979). Current argument of looking into the reality, takes effect only after a study has taken shape. The proponent of such argument, better being the participant in an investigation may have the choice of educing the order of reality (Smart 1976). Then the observer has her/his option of becoming herself/himself a part of the reality by working upon the writing of the text of the study or reinterpreting the text. This may contribute to the continuity of the traditions in the future studies (Winch 1958).

However, such an anthropological stance may not invariably aim at remaking a whole text or giving a reorganised panoptic view of a whole order of reality of a study whose experience she/he can reckon with. Instead, one may find it important to have the proper focus on some undermined areas of experience. If it is necessary, certain mention may be made on those areas, whose typical exposures have been the result of some processual stereotypes (e.g., the so called data). Conveying the idea of the redefineable boundary of anthropological reality is one of the main purposes of the ongoing writing. The reality may be probed for understanding different features of the study experience, encompassing the methodology, the ethics, the data and something more in the same corpus of the facts (Kuper 1987). The details of the sequence of the events in the study period and even those facts lying outside the study having evident bearing on it may be conceived as the resources for interpretation.

In order to unearth some seemingly dominant traditional processes, to explain some indulged reductionism, to highlight some less exposed aspects of methodological and ethical experience more plausibly the present authors have decided to use a case of anthropological study-cum-training in a tribal area of Singhbhum district in Bihar. It was done by a group of post-graduate students of the University of Calcutta under the guidance of a university teacher. A village, inhabited by the tribals of the Santal, the Ho and the Munda communities and a few caste people, was selected and intensively studied with respect to their settlement, economic aspects, political aspects, aspects of kinship, aspects of religious beliefs and practices etc. The village is located at the urban-industrial neighbourhood of Ghatsila and just beside the metal road joining industrial spots. The villagers might avail of easy communication with nearer urban-industrial centres like Moubhandar, Surdah, Jadogorah, Raka and Ghatsila and even distant one like Tatanagar. The people of the village were seen to adjust themselves somewhere between their traditions and changing forces of their surroundings. The differential levels of absorption of changes of the thoughts and the practices, reflected in the individual families, had been found out. Added to these aspects, the material culture of the people from the technological point of view had been studied separately. The people were bilingual, someones even trilingual. They could understand both Hindi and Bengali, other than their own language. The investigators could speak both Bengali and Hindi. The study was not very much

Natundih is surround by Dalma hill ranges and shadowy forest. The inhabitants join in annual hunting festival in this forest. In leisure the tribals never miss the chance of fowling. The varieties of arrow are carefully shaped, used.

Natundih village is seen stretched from metal Road connecting Ghatsila and Tata. The tiled roofed hutments almost submerged under the green foliages and electric poles exhibit urban outbreak in rural setting. Reddish soil is agriculturally productive when turns into Bohal land by the touch of efficient tribals.

eventful. It had some outstanding features as every study has but that are not very novel and uncommon. The study, in any case, needs some general and specific facets of unerstanding.

First of all, the post-graduate training is considered to be very important for socialising the students in research. It may be taken as the intergenerational transmission of the anthropological practices. The university under concern is a major Third World institution from the very beginning of the post-colonial-cum-post-independent period of the nation. This institution could have intended to achieve tangible growth of anthropology on its own, at least, with the spirit of gaining the independent control over the ways of knowing the facts and making others know them. This particular appraisal may also bring out certain impression of its present production of anthropological knowledge (Asad 1972, Diamond 1979).

THE ENTRY INTO THE CONTINUITY

The time from when the beginning of the study to be traced out may remain a pragmatic concern. Guide's personal choice of population or area or subject and his own perception of study, the available chance and contact of that teacher, the regeneration of his previous experience, the time of making the final decision for the specific area for study, the perparation of the students for a specific fieldwork, the first contact with the studied population, the establishment of effective contact with the people and so on had their own roles in the initiation to the study. The guide's past experience of the fieldwork in that locality became the strongest determinant in the selection of the area around Ghatsila township. Guide's assessment of the students of that particular batch, his choice of subject (e.g., agriculturalist tribal people undergoing the changes due to urban-industrial impact), the determination of the season of the work (e.g., the summer, due to the availability of money from university, and the plan for adapting the students to tougher physical experience), adjustment of personal routine of the guide with the routine of the students became the other major factors for the selection of the time and area of study. But, it is really difficult to assign any event to the beginning of the study-cum-training, because whatever be the position of any determinative event in the sequence, none grew out of itself. Everything was seen as related to something other in the past and simultaneously dependent on other for taking effect at present.

However, it was all along the guide's authority to shape the beginning. The students were informed about the selected field site. The period of almost a month was provided for getting prepared. The students were instructed to take information on the Mundas, the Hos, the Santals and others living in that locality around Ghatsila as no specific population had yet been selected. They went through the census reports and district handbooks or gazetteers besides certain other writings on those tribes. Almost similar to their previous experience of field-preparation they felt themselves confused in conceiving the actual limit and possibility of utilisation of the readings in the study proper. Only the hope of interacting with some known codes in an unknown culture made some students keeping at the work, yet without any systematic outline.

The relations within the group, consisting of the students and the guide became important in the arrival of the group in another culture all at once, and in the subsequent approaches of knowing it. All the students were initiated to the fieldwork in the undergraduate level. The male and the female students, all from middle-class family backgrounds, were known to each other, even in the close living of the field. The socialisation for competition in the concerned academic circle of Anthropology has its own pattern of bringing up the interpersonal relations of the students and teacher. It was believed by the students that their teachers in Anthropology played significant roles actually in motivating them almost entirely to the self-interest and least to any collective interest of the subject. The experience of the students about the differential treatment of the teachers started from the undergraduate level. It resulted in their alertness in behaving with the teachers. They always remained sensitive to the authority of the teacher/s. Apparantly there was sufficient adjustment for group activity and living in the field, but in terms of competition there was certain gaps of cooperation and understanding among the students. The teachers, in contrast, were used to explain that the socialisation backgrounds of individual students could not be ignored in assessing their attitudes towards each other and towards Anthropology. The guide in question, as a university teacher, also shared this opinion. Apart from the area of preferential inter-personal relations the students encounter another seemingly impersonal, yet biased treatment. Even the most energetic and hard-working female students in comparison to the male students were not given equal access to all kinds of job (e.g., the jobs of arrangement for the field were in every possibility assigned to the male students). The responsibility for the security of the females might be the most plausible argument rationalising the subdued participation of the females in the field experience. In any case, the students usually became very cautious of being close to the guide, even of altering attitudes towards him. Whatever the characteristics of such relation might be, in the prolonged day and night proximity in the field life certain adjustments between the students and the teacher were set up. Slow acceptance of the authority and instructions of the guide had to be brought in practice.

The arrival at Ghatsila and setting in a camp near the station had not absorbed any noticeable eagerness of the students in the field activities. Some visions of the tribals all around the township, the assumption regarding the possible distance of the field site from the camp, some assessment of the summer weather etc. became some broad areas of thinking. These thoughts were transformed into some kind of anxiety when in the next morning the students found themselves walking tiringly for more than two hours in search of convenient village for study. They travelled in the same direction away from the camp. It was a series of encounters with the people of almost ten villages. Finally a newly settled village, numerically dominated by the tribals (e.g., Santals, Hos and Mundas) and situated beside a metal road joining all the neighbouring industries and towns was selected. It was 16 k.m. away from the field camp. Absence of regular vehicular service to that place was reported. The students were persuaded by the authority to understand the near-perfect criteria for the selection of the village. It was once again realised by the students that the authority of the guide had the principal relevance in determining the study. It also acted as the sole agent of evaluating a student's participation in the work. Such entry into the continuity of authority, plurality of factors determining a phase of work, relations of the students and the guide, role of the students has considerable impact on the succeeding phases of study.

THE FORMATIVE PHASE OF FIELDWORK

The emphasis on the beginning of fieldwork has the principal purpose of having a pause in the elaboration of the whole sequence at a time. It is supposed that the elements present in the phase may provide some more cues of the essential contexts of discussion.

The selection of the village and its reasoning were experienced differently by the students, i.e. the students experienced that the sequence of events in a way differed from that established finally for reasonably understanding it. The shift form an order of thought to another occurred smoothly, as if, it did not bring on any remarkable process. The students and the guide were looking for a village on the western bank of the river Subarnarekha. The guide explained the reason that so far as he knew, it was the west bank where a long stretch of tribal settlement would be available. Crossing the Kumarmangalam bridge it was after walking more than 12 k.m. when most of the members of the team were getting exhausted, in the mean time, the team met the people of the villages of Benasol, Kendadih and Terengah. All of these villages were very close to each other. None of them was observed really unsuitable. Each one had its specific features. Natundih, another neighbouring village utlimately selected was situated just beside the metal road; the settlement was new; it was reported that the tribal and non-tribal inhabitants had no strong connection with the local network of power; of such a newly settled fragment of population (not reaching a population of 200 inhabitants) of the earlier village of Chakulia a few inhabitants met the team in a very friendly manner, though the Santals were known to share the major part of the population, the mixed nature of the ethnic composition of the village was indicative of certain balance in the inter-group relations. These were the main considerations of the guide for taking interest in it. It did not really mean that the students had enough information about other neighbouring villages in order to eliminate those and to concentrate inevitably in the chosen one. It was not very different from a chance accumulation of events and consierations. The considerations mentioned above were on behalf of the guide. They were governed mainly by his responsibility to complete the investigation within the limited span of time, in a more or less trouble-free and secured situation with all possible scopes of easy exit from the village and return to the camp. At the same time it was not permissible to invest more time to selection. The guide had the assumption of finding out a suitable village in that area, in the western bank of the river Subarnarekha. Thus the choice was determined mainly by the chances, events, time and the role as well as status of the guide. The students were taught to take up the work of selection as a distinct job of fieldwork. So more or less arbitrary decision of studying a community had to be put forward in the form of the systematic fulfilment of logically planned goals and efforts. The village community and its features were shown to be the near-exact representative of the universe of the mixed tribe-caste-agriculturalist villages passing through the impact of urbanisation and industrialisation. It was really a construct of an ideal representative, based on some bits of true information. Whereas there could be numerous data which could defy both the reality of such complete universe as well as the satisfactory existence of any such representative. The students were taught only how to follow any valued traditional model of ethnography, even in the short period of study. It was believed by the guide and also the students that the relevance mainly of the normative tradition of Anthropology had prevailed upon the Indian Anthropologists a few of whom would be coming for examining the report of the fieldwork. In the short-term fieldwork of two weeks some of such traditions and trends guided the main body of fieldwork.

THE TRADITIONS AND THE TRENDS

The fieldwork was not truely an endeavour to follow any text or a tradition in particular. On the other hand the fieldwork and its learning might reflect those kinds of traditions and the trends which actually governed the study.

The guide knew it well that in a period of about two weeks it would never be possible for the students to master any specific style of fieldwork. So, the supervisor like his other colleagues being used to keep to some common aspects of studying any community, conceived of a broad schedule of investigation. The rest of the period of field was devoted mainly to the collection of data on the following aspects of the community :

a) The Village;
   i) the settlement,
   ii) the people,
b) The economic pursuits of the villagers with emphasis on
   i) cultivation,
   ii) hunting and fishing,
c) The kinship with emphasis on family;
d) The life-cycle, concepts and practices;
e) The political organisation;
f) The other beliefs and practices;
g) The impacts of urbanisation and industrialisation;
h) The technological aspects.

There had been the detailed categories of each aspect on which data had been collected. The above list exhibited the extensive coverage of data regarding the community. It might also be indicative of the traditional functionalist ethnography.

Before the discussion on the later proceeding of the investigation the authors would like to draw attention to the instantaneous impact on the students of this intended coverage of investigation. The experience of textual readings of normative ethnographies, the Indian or local version of understanding of ethnography and the field practice, the experience of collecting data on the fieldwork of undergraduate level, all assembled to shape some typical ideas of field investigation. These ideas were presupposed. They were renewed in order to justify that with the help of such a plan of enquiry the investigators could know at best the normative outline of some relevant aspects of their society. In a work, it would cover up functional concepts and the practices representing their society or culture in general. All the variations, as obtained from the case studies, were supposed to be the parts, belonging to some organised whole of generality. The students were able to conceive of them in terms of norms, mores, customs, rules, laws, taboos, sanctions, so on and so forth. The cases of deviations and exceptions were judged in the same normative reasoning of 'normal' and 'deviant' categories, functioning for the maintenance of social order. Those cases if pursued so meticulously, might only be utilised to enrich the construct of the generality. The persistence of the generality might thus be preserved with or without the subjection of change. Thus the student investigators consequently knew how to utilise and secure that tradition of preservation. The short time of the fieldwork added the impetus to the quicker process of filling up the inventory of the generality of society or culture of the people under concern. Therefore, some specific means of establishing the normative tradition of knowing a society or culture were behind the emergence of such fieldwork trends, especially in short-time field training.

A few jobs, like the drawing of the maps, spotting and numbering of the families in the hutments, convincing the people about the purpose of coming to their village, making the people cooperative were done collectively in the first two days after the selection of the village. Then it was the random allotment of the' families to the individual students. Each student had her or his own cases of three families; some had to share the families. The assignment of the work to individual student began with the collection of the census data. It enabled every investigator to know some essential information about particular families. Individual student had only to collect specific data contextual to the aforesaid aspects of the life of each family or the family members. The students were instructed not to take any generalised kind of information from any individual informant. It was probably understood that some sort of generalisation would emerge after all such separate data. So, the issue of generality remained central.

The duties were incumbent upon the individual students to grow the necessary personal relationship with the specific informants in order to obtain valid information on that vast array of subjects. From that time onwards it became the individual investigator's very own experience of getting close to the informants' own reality. An investigator might be able to reconstruct her or his own vivid story of interactions with different informants. On the process of these interactions it was found that the initial attitude of suspicion and curiosity of the informants towards the urbane young investigators was changing into a kind of cautious acceptance and adjustments. An investigator while entering into the courses of communication with an informant also felt some specificities of that interpersonal relationship. The investigators could realise also that every informant had her or his own perception of culture or society. The version was somewhat different in the form of consensus when it was obtained from a collectivity of informants. The informant's interpretation was seen to vary even in situations. There again Anthropology rescued the enquirers from all such puzzling diversity. The knowledge of ethnographic texts, read so far, guided the theoretical effort of recognising and differentiating the collective concepts and practices, phenomenally explicit in the domain of the field information. The students were directed to follow never any particular text in order to avoid the bias. The impressions of the readings could only be used. Therefore, the commoner elements and categories of somewhat recurrent concepts and practices were singled out almost in an indecisive manner. It was done by juxtaposing the similarities between investigator's empirical observation and textually mediated impression about other empirical findings. The whole process of categorisation, so also, the collection of the data made tracks for an undetermined empirical trend.

The collection and categorisation of data were finally controlled by the authority of the supervisor and limited by the capacity and efforts of the investigators. The supervisor gave instructions for gathering the terms and their meanings against those possible cultural elements and categories. In spite of all such supporting mechanisms to establish the cultural reasoning, the inferred elements and categories were not more than some empirical impressions of the people's perception of the reality. In every chance they remained incomplete and sometimes weakly conceptualised by the investigators. The bulk of the relevant aspects were found insignificant and discarded, whereas for the sake of fulfilment of intended holistic coverage of enquiry the range of investigation was made extensive. The quantitative and objectively definite information were much relied upon. After the enquiry was over, the investigators came to understand that they were not equipped with any specialised and intensive use of quantitative methods and analyses. It was also clear afterwards that the up-to-date and complete methodology of social sciences were rather weakly internalised by the students in the departmental tradition of the university, for training the students of that level. Moreover, they experienced that the lack of any efficient and short-term means of looking directly into the discrete conceptual realm of the people led to the emphasis on the elements of the realm of the practices. Hence the empirical manifestations in practical objectivity got the focus. The conceptual aspects were indirectly traced out from these information. "Doing what, why, where, when, how, etc." were the highly frequent queries in comparison to questions like "conceiving what, how, when, why, where, etc." At the time of understanding the practices in terms of their functions an investigator quite logically could not remain certain whether the practices described were sufficiently close to the reality. Those quantitative data on population, economy etc. brought in some relief and certainty. Even those quantitative data not being used significantly and efficiently were seen lacking in effective cultural reasoning. Some commoner explanations were supposed to be the cultural reasons of those phenomena. Thus the presentation of an investigator had to fall behind the multidimensional reality of the people which had been experienced during the fieldwork.

Moreover, the students were directed not to blur the distinction between the informant's concrete experience and abstract generalisation at the time of taking information. In the compact daily schedule of doing jobs under other's authority it was tough particularly in that summer to respond equally to all sorts of necessities, especially to those of delicate intellectual activity. So the investigators could not maintain the consistency in selecting differentially the concrete experiences from all the narrative information. At the same time some sort of generalisation was realised to be the aim of the investigation. Individual informants were not always readily available. Hence the domination of the trend of getting at the generalised statements based on some specific information became unavoidable. The group relation of the students was also one of the reasons expediating the trend of collecting information more about 'the overall cultural knowledge and experience' than about 'concrete and particular experience'. If other competitors could not share all the collected information, the ultimate goal of generalisation could not be made so extensive. In the presence of supervisor at any spot of enquiry it was always the careful detailing of experience of any particular case. Otherwise, the investigators were after the fullest coverage of information regarding any aspect of study. For this purpose, only those informants who knew much became indispensible. Anyone would feel herself or himself fortunate in getting the scope of utilising such individual, as if, culture or society might be best maintained by an information bank. The investigator-informant relationships were also disrupted by these reductionist attitudes. Certain informant was valued highly in comparison to another. Simultaneously, certain investigators were more preferable to certain informants. The disruption of relationship ensued from the boring adjustment between the likings of the informants and the rigid purposiveness of the investigators. The people showed hospitality to every student. The adult working informants wasted some productive labour-hours. They even conveyed to the investigators that they were not getting anything in return of serving the interests of the students. Every family, especially the female folk cooperated with the student-investigators unto the last. Ultimately the data regarding the people and their social-cultural aspects studied were of large amount. They may be selectively mentioned to respresent some trends. For instance, total population of the village Natundih is 186 of which 158 (84.95%) are the tribals and 28 (15.05%) are the non-tribals (Table 1). Unavoidable dependence on investigators' rationality and sensibility had their remarkable inception probably from the estimation of the ages of the informants and their family members. A few informants had the convincing utterance of their exact ages. Otherwise the witty and indirect approaches helped the investigators to get close to the approximate ages and many such culturally trivial issues.

Table 1. *Population Distribution in the Village*

Sex	Community				
	Santal	Ho	Munda	Caste People (Bhakat, Lohar, Dhibar Baisnab, Velalla)	Total
Male	48	28	5	14	95
Female	52	21	4	14	91
Total	100	49	9	28	186

This account of population had been obtained and analysed in terms of age and sex also literacy, marital status, age at marriage, working population, occupational types involving the population etc. were also included in the major heads of population account. Each account was allied to any broad aspect of the enquiry. It was observed that most of those accounts constituted a separate chapter. They served the limited population background as well as the social and cultural aspects in the methodological sense. The absolute numbers, rates and ratios produced in tabular forms, graphical and a few other projections were analysed and interpreted mainly in terms of perceptible regularity and exceptions. As for example, in case of literacy the account stood like the following (Table 2).

Table 2. *Distribution of literacy*

Level of education	Community									
	Santal		Ho		Munda		Caste People		Total	
	M	F	M	F	M	F	M	F	M	F
Class I – IV	8	5	3	1	0	1	5	1	16	8
Class V – VIII	4	0	3	0	0	0	0	0	7	0
Class IX – X	3	0	3	1	1	0	3	0	10	1
Class XI – XII	0	0	0	0	1	0	0	0	1	0
Graduation	0	0	1	0	0	0	0	0	1	0
Total	15	5	10	2	2	1	8	1	35	9

Other than describing the numerical positions mainly in the forms of comparison and contrast, the analysis could not delve into any specific or general background. The investigators did not even feel curious about the reasons of taking such account, separated from any following context. All such queer attempts of collecting information on many unexplained categories might have culminated in the belief that there might be some conventional categories on which information had to be taken without questioning much about their relevance ! The acceptance of the such practices of data collection pervaded the whole course of investigation. The weakness of the investigation might have reflected more with respect to the investigators' understanding about the relationship of the categories than in the pure theoretical logic behind the network of the categories. For instance, the quantitative data on working population of the village was obtained in terms of communities and types of occupations (Table 3).

Table 3. *Distribution of the Working Population*

Principal Occupations	Community									
	Santal		Ho		Munda		Caste People		Total	
	M	F	M	F	M	F	M	F	M	F
Land owning – cultivation	23	0	6	0	2	0	0	0	31	0
Land owning – Supervision	1	0	1	0	0	0	0	0	2	0
Share-cropping	2	0	0	0	0	0	0	0	3	0
Agricultural labour	3	8	1	1	1	0	2	1	7	10
Collection of forest produce	0	14	0	9	1	1	0	4	1	28
Artisan work	0	0	0	0	0	0	7	0	7	0
Non-agricultural wage earning	0	3	3	2	0	1	0	1	3	7
Service	2	0	5	0	1	0	0	0	8	0
In all occupations	31	25	17	12	5	2	9	6	62	45

The above scheme did not include the household work and some peripheral occupations of the sub-adult individuals. So, the account of the working population might be viewed incomplete. If it was not, the reasons were not satisfactorily tuned to the students. At the same time there were many individuals whose principal occupations could not be fixed up easily. For example, a Santal owner-supervisor of big quantum of land had his service in the local HCL industrial plant. He was the sole supervisor of his land and sometimes he had to go to the field with plough and bullocks. He had no hesitation to say that his normal agricultural turnover of a year exceeded his manual income from his service. The individuals specialised in agricultural labour had to rely much on non-agricultural jobs of wage-earning. All such confusing overlapping of the occupations created the problem of categorising the occupations accordng to the number of individuals. The conjoined category like cultivator-wageearner/agricultural labourer, sharecropper-wage earner, agricultural landowner-service holder etc. was contemplated crude solution of the problems. Individual informant's own choice of her/his principal occupations were noted down at first. If they were not found to divert considerably from the investigators' judgement, the category was taken to be final. Otherwise, the investigators' rationality dominated the categorisation. The difficulty arising from other occupations of the same individuals was circumvented by taking a simultaneous account of the subsidiary occupations. Apart from the jobs of approximation, the rest of the contexts like that of cultivation were considered in some scattered manners. The students collected information on the social organisation of production, factors of production, technology of production etc. in a less coherent framework. The case-studies were the means to reach the concrete information. It was, however, impossible to get at one of the most concrete domains like the individual land holdings of the villagers. Realising the difficulties of the 'sensitive' areas of reality, the remaining others were probed without being governed by any theoretically or empirically intensive approach. Even in the 'laborious' participant observation in one hunting festival of the tribals, *Ruam Buru Sendra,* the male investigators only got the chance of participating in the whole course of the festival. They only tried to note down the details of the events which took place in front of their eyes. The instantaneous interpretations of the busy informants were supposed to be the approximate cultural meanings representing the events which seemed significant to the investigators. Almost to all the male students that experience was remarkable. But that to what extent it became anthropologically productive ought to be an important question. The focal aspect studying the impacts of urbanisation and industrialisation on the villagers was assessed with respect to some stray and some empirically evident traits. Thus, as a whole, the question of anthropological productivity might seem a less pertinent affair with respect to the data in some selected aspects at the field training in post-graduate level. The field experience of the student-investigators might be endowed with any quality of the technical aptitudes and the ethical developments. In any case it may enjoin duty on those investigators, engrossed in the work, of answering for the productivity of anthropological experience. The unfailing overtone of criticism of this reconstruction of experience would be supposed to be one of the most unequivocal reflection of the suppressed experience.

However, the end of fieldwork had been marked by the sadness and sorrow of separation. The investigators gave their addresses of correspondence to the informants, promised to send letter and photographs. The investigators came back to their homes in Calcutta and its neighbourhood. The field report was prepared according to the instructions of supervisor. They failed to maintain any promised contact with those villagers, besides a few exceptions. Simultaneously the memories faded in quick succession. They still regret their negligence and lack of any commitment to those people. Infact, they were bound to submit the report on the fieldwork for the sake of their career. But no such compulsion was there even to pay minimum care to those relationships. The investigators could not help keeping those out of their own social settings. Awaited for the next field study were the familiar experience of field life, the familiar sight, sound, smell and other such phenomena of the field site and the previously known patterns of interactions with the comparable tribal or rural people and so on. The next fieldworks of the authors on the tribal people really awakened almost a dormant world of the reminiscences. The very specific phenomenal world of the anthropological workers had been reapprearing. The world was, however, refurbished almost in the same previous processes with the focus on the same reductionist attitude towards the reality. The reality of search and the reality sought were dominated by the similar alienation from the vivid temporal experience of the investigators.

In the fieldwork at Natundih village the investigators did not see the scope of realising that they could share only some time with the villagers concerned. Even in the contexts of concrete observation of the practices of that time they were far behind the 'so-called' stage of sharing all the meanings of their culture. Seeing something minutely and reporting that with some suggestive analysis ought not to be the act of knowing the intended reality. The student-investigators in most part collected information verified the reported information about the culture from different informants and considered them as valid data of the reality of the culture. Actually it was real that during the time of two weeks in different situations the villagers were kept on informing about their experience of the society and culture. These all were information about reality, collected by those investigators who even could not share the meaning of those information. These information about the practices of the people could not be depicted as the reality itself, as estranged from situational contexts. The reality of their society or culture could be constructed on the basis of the information, if the ethnographic fiction makers could aptly articulate the findings in keeping with the image of reality. Indeed, the investigators were taught to build an integration of both the real and 'fictional' data in the light of ethnography. It may not be a stretching inference that the socialisation of the student-investigators in their close social organisations of family, educational institutions etc. had tangible role in casing them conformable to all situations. The power relations between the guide and the students or the student-teacher relationship may further explain the weak involvement of the students in the work and the consequent indifference to their anthropological experience. Obviously it may be contemplated that the anthropological traditions and trends would not be said to have matured enough to result in any breakthrough. The authors really now feel that they can not help inheriting those learing hitherto. The scrutiny of their present and future field studies can bring out more facts corroborating the inheritance. Some effective realisation of the present write up endorses only the hang-over in such study-cum-training that asserts.

CONCLUSION

The realisation and the consequent reconstruction of anthropological experience was the prime concern of this appraisal. Different theoretical links to different concepts used in this account are not separately mentioned mainly with a view to communicating the experience very simply. The work has also escaped many aspects and details of the reality. At the same time, the features in focus may claim more intensification. Also the emphasis on the methodological and ethical aspects and simultaneously on the student-investigators are the chosen alternatives. One such work of reinterpretation, piecemeal in nature, was aimed neither at motivatng any specific theoretical replacement nor at proposing any comprehensive outline of short-time field-investigation. The effort is supposed to have grown out of the prevalent urge of exploring the reality of an academic experience in certain Third World university education. It has strived to bring out the significant events, trends and traditions of the study revealing the nexus between the ethical and purely technical aspects.

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The Expanding horizon of Anthropology with particular reference to India

P. K. BHOWMICK

ABSTRACT : The paper deals with the gradual development of anthropology as a subject for the study of man. In India its emergence took place through the necessity of administration as well as scholastic approach. The subject was included in the curriculum of different universities in India with elaborate research programme. The applied value of the subject and its impact on the current policy making and disaster management is highlighted in the paper. Specific areas were pointed out where anthropologists will make valuable contributions in the realm of nation building and maintaining national integration.

[I]

Anthropology took a long time to grow as a scientific discipline. The subject involved in studying people from a close range, through interactions and field work. By anthropology we conservatively understand the matter related to biological anthropology, race and racial classifications, palaeoanthropology, including the details of pre-historic archaeology, ethnology on one part; and aspects of cultural and social life of man, on the other. Individuals are involved in it with their distinctive roles and status. All these form part of Anthropology. Special emphasis given on the study of life and culture of the so called primitive people or tribal group. The tribal groups have a low level of technology and are closer to nature even now. Movements of people, followed by colonization in later period, particularly in European countries, necessitated the noting of the life-style of the people belonging to other culture. These became potentially anthropological materials. It is also true that colourful, lively accounts of so called sons of the soil, i.e., autochthones people, constituted anthropological materials in the global context, though these were collected and collated in an unsystematic way. Most of the European countries, specially the Dutch, British and Portuguese people took particular care to explore the cultural life of the people of their occupied territories and gradually a lot of anthropological materials were added over the years. Therefore, peculiar customs as relics of the past and many other things were noticed due to a mentality of 'curio-study'. The Missionaries wanted to convert some people; so, a knowledge about them was undoubtedly helpful. In knowing about the subjugated people might also have helped the smooth running of the administration. Administration needed anthropological materials for policy-making and to overcome the problems in different interactional levels.

Sol Tax (1977) has elaborated the growth of anthropology in European countries as well as in the United States of America. He quoted chapters and verses from many anthropological memoirs in support of his views. He pointed out the turning points marked by eminent scholars. Quotations from Boas in America, Malinowski and Radcliffe-Brown in England and others in different parts of Europe were used. He discussed their field work and method of interpretation. Incourse of time learned Societies and institutions were formed which disseminated knowledge about different culture and society. The earlier ones were Society of the Observers of Man (Paris, 1800), Society for the Protection of Aborigines (London, 1838), the Germany Archives of

Anthropology (German, 1865), Ethnological Society of London. With the same view Ethnological Society and Anthropological Society were established. Society of the Friends of Nature (Moscow, 1866) was with a special section of Anthropology and at Madrid a Society of Anthropology (1865) was formed. The International Congress of Anthropology and Pre-historic Archaeology sessions were held in 1866, 1867 and 1868. In addition, a rival group of Anthropologists organised Anthropological Institute of Great Britain and Ireland (sometime in 1873). There are organisations with applied researchers which suggest remedial measures to the administration. Among them were the Royal Tropical Institute of Netherland and the Society for Applied Anthropology (U.S.A., 1941) and others. Many such Institutes published journals, bulletins, books and research findings. These have ultimately enriched knowledge on Anthropology. Vidyarthi had tried his best to put all available information in his book *Trends in World Anthropology* (1979) and in some other papers, like Social Science in India : A Social Anthropological Approach : Some Preliminary Obversations (1965, 1966) had reflected the Indian context.

[II]

The situation is different in Indian Context. As one of the centres of the earliest human civilisation, information and literature about life style of the *Janas* i.e. men, had been immense. The Vedas illustrated such life-style of people, including the ethnology. All the same, it is reflected that the Indian civilisation is nothing but the story of conflict among the local *Janas* with the others, either technologically higher or culturally superior. A systematic life-style of the people emerges out of the epics and *Puranas*. British colonial rule subsequently demanded the details of the life-style of Indian population. These were deemed important for smooth functioning of the administration. Consequently, a good number of accounts or books were written by foreigners. Dalton, Risley, Herpertson and Hutton's contributions are significant. In this way, information on limited anthropological investigation about the Indian civilization are available. The vast areas of anthropological researches in India began with stress on ethnography and pre-history. Later on, physical anthropology and language were covered. Sir William Jones established the Asiatic Society of Bengal and was interested in publishing not only the ethnographic materials but also religion, folklore etc. This Society can be recognised as the pioneer organisation which persuaded systematic Anthropological researches and the publication of the same. Vidyarthi has considered the Society as 'The Beginning or Formatory Period' (1774-1919). Anthropologically oriented materials and data were published in Asiatic Soceity (1784), though the main thrust was on 'nature and man'. Some officers with a scholarly bend of mind were posted at different parts of the country, specially in rugged terrains with concentration of tribal people. Their writings or monographs attracted the attention of the scholars in the field. Thereby more Anthropological materials were gathered for the scholars. The Indian scholars, like S. C. Roy, R. P. Chanda, H. C. Chakladar, A. K. Iyre's made some noteworthy contributions.

The second phase of anthropological investigation is termed as the Constructive Period (1920-1949). At this stage Anthropology in University course curriculum was introduced. In the University of Calcutta, Anthropology was included as a part of Ancient Indian History and Culture since 1916. It became a full-fledged post-graduate department in 1921. The credit for this goes to Sir Ashutosh Mukherjee, who took personal interest to open the department. Many experts and erudite persons who had contributed in the field were requested to serve in the department. A. K. Iyer held the chair for a long time and he wrote some books on ethnography. Non Anthropologists have distinctive roles to play in developing the subject. Many other *pundits* contributed on different aspects of Anthropology, specially on race, racial history, religion, pre-historic archaelogy, with an emphasis on tribal groups, including the caste. Rai Bahadur S. C. Roy published the journal – *Man in India* – from Ranchi and it is the first journal in Anthropology.

After 1950, a new trend in Anthropology emerged with more research topics which were emphasised by the scholars. Thus new dimensions in Anthropology were traced. With the involvement of many foreign scholars, joint venture was started. From this Anthropology found new job-possibilities and at the same time opening up of new departments in other Universities. With the end of the colonial rule Anthropologists in India were faced with challenging aspects of development in the framework of caste and tradition-bound societies.

[III]

The nebulous state of Anthropology as a 'Curio-study' or means of reconstruction the past history of 'man' for interpreting the various so called pristine culture traits as relics of the past is long overcome. Colonial administration or aggresive Missionary approaches for noting manners and customs of the people encouraged a systematic development of ethnography through field-work. This approach was reasserted by Morgan, Malinowski, Radcliffe-Brown, Rivers and others. This method became dominant for the anthropological studies. In India, similar contributions by S. C. Roy, Iyre, Das and some administrator-scholars, like Mills, Hutton, Gurdon etc. are noteworthy. It became a common practice for the anthropologists to undertake fundamental field work among the tribes of India. As a consequence, plenty of evidence of anthropological materials in the form of tribal ethnography came into existence. Observance of rituals, religion, folklore, myth-mythology were made. Study of cultural aspects reflected similarities and dissimilarities of cultural traits in various zones. Common traits indicated interactional phase of human groups, gradual blending and compositions processes (Sengupta, 1977). These were eleborated at a later phase by N. K. Bose in the book 'cultural anthropology' (1928). The study gradually took a different form while approaching complex societies. Robert Redfield in his study of 'Peasant Society and Culture' dealt at length on the anthropological approach to civilisation, indicating great and little traditions emphasising how literate tradition is being manifested in 'great tradition', while non-formal and oral traditions are ingrained in 'little tradition'. Greater elaboration has been reflected in the writings of Bose, who asserted that even the tribal culture of India is not isolated. However, after Independence, when the Community Development Programme was initiated, a trend of the American anthropologists was developed in India in order to study the villages. Through interactions and various network, the American Scholars, like Morris Opler (Cornell University), Oscar Lewis (University of Illionois), David Mandelbaum (California-Berkeley), Mackim-Marriot (Chicago), along with the British anthropologists T. Scarlett Epstein, contributed to the subject potentially. Many Indians took interest in village studies. Psychological studies were not neglected, but they were not very significant in anthropology. Anthropological Survey of India has a research wing in this respect and their occasional research papers published drew the attention of the scholars. Fundamental research works on kinship, family studies, with the caste and communities are found. Along with these, religion, folklore and other aspects of festive life as well as market studies are done. All these are varied aspects of studies and are found to have been included in the course-curriculum of many universities of India.

Status of Anthropology as a 'Science of Man' has been raised to a 'Science for the service of Man'. As a result, we find involvement of anthropologist in administration and welfare activities. These have been accepted by the Government and many Voluntary Organisations as also those who are involved in welfare or development work. In earlier phase of Community Development Programme, some anthropologists were involved. Many State Governments have Tribal-Cultural Research Institutes to study the tribal people from a close range in order to assess their problems and to suggest remedial measures. In this way the role of the anthropologists changes as applied scientists. Vidyarthi has made elaborate divisions of the applied-action-anthropologists in India and had clearly indicated that they are involved in tackling problematic situations and contribute potentially for the welfare of the people. There are Government organisations, like the Ministry of Welfare, Commission for the Scheduled Castes and Tribes. Active participation of the anthropologists in pinpointing the problems and in suggesting remedial measures have been recognised. In decision-making purposes to circumvent the crisis situation, interact again impact due to industrialisation or urbanisation, role of applied-action anthropologists cannot be over-emphasised. Under the circumstances, in course-curriculum of anthropology all these fundamental aspects are present. New materials by research and field studies are added by the scholars. All these offer some solution for the emerging hydraheaded problems of our country. Many Universities, include anthropology in Post-graduate, Undergraduate syllabi and/or Higher Secondary level. Course-curriculum in the Universities have wide scope for research. Senior scholars diagnose not only the surface problems but also look into the possibilities of constraints. Anthropology in India, not only changed in form, content, research plans and objectives but also suggested new vista for the overall betterment of the people. As 'the Science of Man' Anthroplogy plays a role in the rebuilding of the nation by greater and closer understanding and seeking mutual involvement in matters of life-processes.

[IV]

There are 30 Universities where anthropology is taught in Post-graduate Departments. Besides, there are a few Post-graduate Centres under some Universities and a good number of affiliated Colleges upto Degree standard. In West Bengal, there are a good number of Higher Secondary Schools, where anthropology is being taught. Anthropologists are members of the teaching faculties in Sociology and Museology departments. Universities have both theoretical and practical classes. Attempts are being made to modernise the syllabus and to bring uniformity in the syllabi in All India level. In most of the Universities Anthropology include Physical Anthropology and human genetics, Palaeoanthropology or Pre-historic Archaeology and Social/Cultural Anthropology, Field Work and Musuem methods. Recently greater stress is laid on Applied-Action-Development Anthropology where special emphasis on tribal studies are given. Constraints of development are examined. Researches for thesis or dissertation in the Post-graduate classes have widened their scope of field work in order to locate the social problems. These automatically earmark new areas and demand a systematic study and analysis. Besides the academic bodies, there are Government Institutes, such as the Anthropological Survey of India (A.S.I.), attahced to it are branches like Bio-chemistry, Folklore, Linguistics, Psychology etc. providing inter-disciplinary researches. They recruit staff researchers, who are guadually promoted and placed in important positions. Research materials are being published in the form of reports and books. There are a few other Central Government bodies, such as Museums in different States where anthropologists are recruited as staff. National Institute of Rural Development (NIRD: Hyderabad), National Council of Educational Research and Training (NCERT : Delhi), Indian Council of Social Science Research (ICSSR : Delhi and Bombay), All India Medical Institute (Delhi), Ministry of Welfare (Tribal Development), Minstry of Home Affairs (Commission for the Scheduled Castes and Scheduled Tribes) and the Wing of Census Operation are very important Centres for recruitment of anthropologists for research and other purposes. A member of All India Medical Organisations, sponsored by the Government, employ anthropologists for research and orientation work.

A good number of States have Tribal Cultural Research Institutes attached to Tribal Welfare Departments where anthropologists are working. Their main function is to conduct research, specially in the problem-ridden areas related to Scheduled Castes and Scheduled Tribes. All these indicate the absorption of anthropologists at various levels related to Development Anthropology.

There are a good number of research bodies and Voluntary Organisations. Many of them employ anthropologists, it can be said in brief that the role of anthropologists has changed a lot. They are performing special roles, mostly relating to welfare and development. Mass communication centres, radio and television departments have separate cells viz., Audience Research Units, some Banks recruit anthropologits. It is clear that traditional anthropologists are now in a position to hold their own with distinction, relating to either action oriented activities or fact-finding research areas in the realm of nation building.

[V]

A new trend of interdisciplinary research and studies are slowly emerging. In a way, the 'Science of Man' has now become the 'Science for the Services of Man'. We also realise that course-curriculum of the subject has been modified. A few important areas are cited below where trained anthroplogists should be employed :

I. Development Anthropology : It has been reiterated time and again in general that anthropologists are in a better position to understand the society-culture of people where they can visualise the constraints as well as empatibilities of development, any alternative way of living that may be offered to overcome the age-old difficulties of people. Sol Tax coined the term 'action anthropology', meaning that the anthropologist participates in the work like a physician involving himself to analyse and prescribe new media, whenever needed. Action anthropologists deal with the urgent problems of any group of people. Along with these, mid-term evaluation of the welfare projects should be made, so that constraints in implementing the development schemes can be diagonised and, as such, alternative ways may be suggested. After Independence, huge sums of money has been spent over the tribal groups but the nature of development is not upto expectation. Social anthropologists will have to come forward with their action-oriented schemes to impress the administration. For immediate or urgent problems, which require temporary welfare activities in the form of make-shift and permanent rehabilitation in situations like riot, floods, storm and other natural calamities, the capacity for instant analysis and action of an anthropologist; is a must.

Anthropologists study deeply into the problems of sanitation, health, hygiene and nutrition and may act as an intermediary between people and the government. There are certain areas where good drinking water is not available. There might be some other areas with ecological hazards. The group of people living there may not be fully aware of these situations. An awareness must be inculcated in them to ward off such impediments. Awareness about the nutritional deficiency should be introduced through cultural aspects. At the same time, the prevailing diseases and the disease-concept and treatment pattern vis-a-vis Primiary Health Centres, as well as other facilities should be studied for a better health upkeep. Since if the public money which is spent for the same through Government agencies.

For expectant mothers, introduction of trained *Dais* (midwife) in the remotest corners should be arranged. All these are related to development anthropology.

II. Re-study of the tribes and castes in the light of new ethnography and ethno-science. Leach has projected a view in his 'Re-thinking anthropology' (1961). In the Indian situation, this is important. The then British administration projected the native people according to their necessity of exploitation and keeping them in subjugation. Many terms, not understandable to them, had been used which often undermined them. To Re-study these groups with an Indian outlook and native approach, with an unbiased mind, treating them as our brethren and brothers should be done by the anthropologists.

III. Problems of ethnicity : Ethnic and identification crisis have created new problems. The disruptive forces that are weakening the national integrity should be given proper consideration. India had been partitioned and she is gradually being segmented into many pieces on the basis of ethnic identity. The mode of overcoming this fissiperous tendency is the burning question of the day. It is an area where anthropolgists can work fruitfully. N. K. Bose suggested, most of the so called tribal people are not isolated there is sharing of culture by the greater community in many ways, viz., worship of stones, trees and animals. All integrating forces can be highlighted. Participation of all people on festive occasions, sharing the common songs and dances are indicated in this regard. Anthropologists can contribute to many more cementing factors to circumvent this growing crisis. They are on a vantage-ground to be able to locate the areas and are able to contribute potentially.

IV. Another important area is to study of women and aged persons in the changing socio-economic perspective of the modern times. Their problems as well as their adjustments to the next generation can be studied and orientations can be made accordingly.

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